Security survivor NetScreen CEO Robert Thomas talks about life after an IPO for his VPN and firewall company. PAGE 10.

RBOCs gain ground The Bells' national long-distance strategies start to take shape. PAGE 27.

NetworkWorld

The leader in network knowledge ■ www.nwfusion.com

January 6, 2003 ■ Volume 20, Number 1

Security worries give start-ups hope

■ BY ELLEN MESSMER AND DENISE DUBIE

With the hope that corporate security concerns will translate into spending, two newcomers this week will debut offerings intended to keep network intruders at bay.

Singlefin, a $1 million privately funded company, will offer a service that promises to scrub e-mails for viruses and keep other unwanted missives off corporate networks. Separately, Imprivata, a $13.6 million venture-backed company, will offer a gateway appliance that works with client software to let customers apply single-sign-on control over custom and Web-based applications.

The companies are entering the market at a time when security budgets are expected to increase more than overall IT spending as companies install or improve antivirus, content filtering and authentication software, and firewalls. About 40% of 225 CIOs who Morgan Stanley polled last

See Security, page 57

IP services hot; IP spending not

Most companies slow to abandon legacy data networks.

■ BY CAROLYN DUFFY MARSAN

Internet traffic might be growing at an explosive pace, but the same cannot be said for IP-related spending.

This dichotomy can be seen not only on the furrowed brows of service provider executives, but also in the hedge-your-bets approach to IP services that corporate network professionals have adopted.

Despite all the hype surrounding the Internet, IP services remain a tiny fraction of service spending, the majority of which is still devoted to long-distance voice and traditional data services such as frame relay and ATM. Internet access brings up the rear.

Most corporations are sticking with their legacy data networks even as they see significant growth and promise in their Internet applications. This leaves the entire Internet industry — carriers, equipment providers and software vendors — facing a slower transition to IP services than was anticipated during the go-go years of the late 1990s.

Overall, IP traffic continues to grow at a robust rate even as the revenue per bit that carriers earn on that traffic keeps dropping.

See IP spending, page 12

Grid-dy determination:

Grid computing systems are moving out of academia and research labs and into the enterprise as a way of harnessing unused CPU cycles for compute-intensive applications. Page 43

IBM software strategy: Knock off Microsoft

INSIDE IBM SOFTWARE
First of two parts

■ BY JOHN FONTANA AND ANN BEDNARZ

It has taken seven years and billions of dollars in development and acquisitions but IBM is now in position to achieve one more lofty goal: beating Microsoft at its own game.

Rivals such as Oracle, Sun and BEA Systems have felt Big Blue's muscle. Now Microsoft, IBM's sometimes comrade, sometimes competitor for the past 20 years, is the foe as the two giants have emerged as heavy favorites in a race to build software that connects systems, applications and business processes between and among corporations of any size.

"These two are the leaders in the battle to define who will become the company that is the major influence for IT architecture and systems for the next 20 years," says Dave Cearley, senior vice president for research operations for the Meta Group.

However, clearly the companies have different strategies to win this software race. IBM takes a cross-platform, heterogeneous approach; Microsoft relies

See Software battle, page 14

■ JPMorgan Chase bets big on IBM with $5 billion IT outsourcing deal. Page 8.

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NetScreen CEO Robert Thomas sizes up the VPN market in our Q&A.

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Features

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We've made it easy to access articles and resources online. Simply enter the four-digit DocFinder number in the search box on the home page, and you'll jump directly to the requested information.

News Bits

CIOs see 1% spending dip in 2003 . . .

■ Goldman Sachs last week rang in the new year with a report hinting that the cautious optimism of late 2002 regarding an industry resurgence didn't make it through the calendar change. In the investment banking firm's most recent poll of 100 CIOs, respondents said they expected IT spending in 2003 to decline 1%, down from the 2% to 3% growth predicted earlier. The survey also showed respondents' view of long-term "normalized" spending growth dropped from a high of 7% over 2002 to an expected 5% in 2003. "Such severe declines in sentiment coming out of budgeting season confirm the ongoing business weaknesses that we have noted at key end markets — in particular telecom, financials and manufacturing," the report said. CIOs surveyed indicated top spending priorities to be security, wireless LAN connectivity, Web-based application infrastructure, next-generation Windows operating systems, integration software, Gigabit Ethernet and storage networking.

. . . while second survey sees worldwide growth

■ Worldwide IT spending will grow 4% in 2003, rebounding from growth of just 1% in 2002, according to research released last week by Aberdeen Group. This level of growth will continue through 2006, with little chance of a return to the double-figure percentage growth rates of the late 1990s, the company said. At the moment, there are no compelling reasons for user organizations to spend heavily — whether on new technology or on upgrades to existing technology — to bring back those earlier high growth rates, Aberdeen said. According to Aberdeen, strong market sectors in 2003 will include Linux servers, which will see 40% growth in sales as Linux continues to make inroads into corporations; outsourcing, which will account for a greater proportion of IT budgets as corporations focus on IT cost reduction; wireless data services; and particularly wireless LAN systems, which will be a bright spot in a telecom market that will continue to grapple with issues of overcapacity and thin margins.

Internet turns 20 . . . by one count

■ The Internet's so-called 20th birthday on Jan. 1 passed by without much fanfare, perhaps because much of the 'Net's origins are a matter of debate among high-tech historians. There's no question that on Jan. 1, 1983, a key milestone occurred when ARPANet — the predecessor of the Internet — switched from the older Network Control Protocol to TCP/IP used today. All ARPANet hosts were required to switch to TCP/IP no later than on New Year's Day 20 years ago. There were only about 250 computers hooked up to ARPANet at the time, and many hosts made the transition to TCP/IP throughout 1982. Whether or not the switch to TCP/IP is the logical birthday for the Internet is a matter of opinion. By Jan. 1, 1983, ARPANet had been in use for more than a decade. It was conceived by the military in 1969 and was in regular use by 1971. So just how old is the Internet? 20? 32? 34? You decide.

COMPENDIUM

Why Internet Explorer is so fast

Brian Tiemann did some packet sniffing and discovered that Microsoft has tinkered with the basic setup of an IP connection. Works great with Microsoft Web servers, but could cause problems with non-Microsoft servers.

Read more at: www.nwfusion.com, DocFinder: 3743.

■ TheGoodTheBadTheUgly

In the 'Net we trust. Americans have bought so much into the Internet that even those not on it appreciate its value. According to a telephone survey by the Pew Internet & American Life Project, about two-thirds of non-Internet users say they would expect to be able to find desired information on the 'Net in at least one of four categories — healthcare, government, news or shopping.

3G takes another hit. AT&T Wireless Services is scaling back and delaying the launch of a planned 3G mobile network, now planning to offer the service in just four cities by the end of 2004. The revised plan calls for a commercial Wideband Code Division Multiple Access service to be launched in San Francisco, Seattle, Dallas and San Diego. The company originally pledged to launch services in 13 of the top 50 wireless markets by the end of June 2004. But the expense of rolling out the network combined with a lack of strong customer demand in existing 3G markets has forced the carrier to rethink its plans.

The year of bankruptcy. Five of the largest bankruptcies of all time took place in 2002, led by WorldCom, which had assets totaling about $104 billion prebankruptcy, according to tracking service BankruptcyData.com. Conseco, Enron, Global Crossing and United Airlines, which all filed for bankruptcy protection last year, also earned placement on the all-time top-ten list. ➤

Court 'slams' name registrar

■ Internet domain-name registrar Register.com last week won a preliminary injunction against a reseller of domain-name registrations that it accuses of deceiving Register.com customers into transferring their registrations. A federal judge granted a preliminary injunction against Domain Registry of America to block it from using alleged marketing tactics that Register.com said are deceptive. The case involves alleged domain-name registrar "slamming," which is similar to a tactic in which telecom carriers lead competitors' customers to switch their long-distance service through deceptive practices. In this case, Register.com alleges DROA tried to make domain-name holders believe their registration provider was DROA when it wasn't and said DROA was affiliated with Register.com. An attorney for DROA could not be reached for comment.

Global Crossing gets new leadership

■ Global Crossing Founder and Chairman Gary Winnick resigned last week, two weeks after a federal bankruptcy court accepted the carrier's Chapter 11 reorganization plan. Global Crossing named independent directors Jeremiah Lambert and Myron Ullman as co-chairmen to lead the company through its emergence from bankruptcy, which is expected early this year. Winnick had been roundly criticized because he sold Global Crossing stock for $124 million in May 2001, eight months before the company filed for bankruptcy.

Building carrier class enterprise networks

Availability in enterprise networks has improved in recent years – but it's come at a price, and still doesn't approach what you expect from carrier networks.

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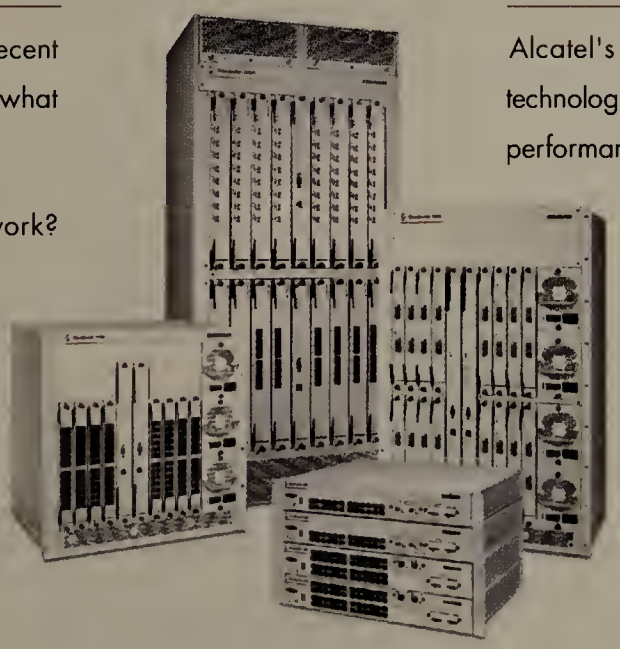

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Financial firms bet on outsourcing

■ BY ANN BEDNARZ

IBM's $5 billion, seven-year outsourcing agreement with JPMorgan Chase is the latest and most valuable in a string of multibillion-dollar deals recently forged between IT services firms and financial institutions.

Financial services firms are turning to outsourcing to lessen IT costs and management burdens, free up cash, and find better ways to respond to fluctuating market conditions, analysts say.

IT agility is key to financial services companies, which face economic pressure from shrinking transaction volumes yet shoulder intense computing requirements, says Tom Kucharvy, an analyst at Summit Strategies. "The need for outsourcing among those companies is clearly on the rise," he says.

The JPMorgan Chase pact announced last week calls for IBM to handle a significant portion of the firm's technology infrastructure, including its data centers and voice and data networks, as well as absorb 4,000 JPMorgan Chase employees and contractors. JPMorgan Chase will retain control of some IT functions, including application development and delivery, and desktop support.

Considerable infrastructure consolidation is on tap, says Paul Sweeny, general manager of the financial services sector for IBM Global Services. IBM plans to reduce JPMorgan Chase's 16,000 distributed servers by about half and move from 37 networks to a single voice and data network, Sweeny says.

In addition to the JPMorgan Chase deal, IBM last month inked a $2.6 billion, 10-year agreement with Deutsche Bank to manage some of its computer centers.

IBM isn't the only company landing big outsourcing deals.

Electronic Data Systems (EDS) landed multibillion dollar deals with financial services companies Bank of America and ABN Amro in December.

The Bank of America contract is a 10-year, $4.5 billion outsourcing agreement whereby EDS will reengineer and manage the firm's voice and data networks.

The ABN Amro outsourcing contract — valued at $1.3 billion over five years — covers provisioning of technology services and applications development for ABN Amro's wholesale client strategic business unit.

Also in the billion-dollar club is Hewlett-Packard, which in September announced a seven-year, $1.5 billion outsourcing agreement with Canadian Imperial Bank of Commerce (CIBC) to manage much of its IT infrastructure, including desktop PCs, software and network gear.

What's significant about some of these outsourcing agreements is not only the size of the deals but the services delivery and billing methods. Financial institutions are buying into utility-based pricing models that allow them to obtain IT services such as server processing and data storage on an as-needed basis rather than buying fixed IT services with fixed prices, analysts say.

"When the need for transaction processing drops, as it will in a downturned stock market, [customers] can cut back without having to lay people off or continue having to carry a lot of unproductive capital equipment like mainframes and servers," says Bruce Caldwell, principal analyst at Gartner.

The flexibility of pay-as-you-use services appeals to JPMorgan Chase, spokesman Michael Dorfsman says.

"As our needs grow, or if they contract in certain areas, it enables us to be able to purchase or use the services that we need, on an expanded basis or a curtailed basis, rather than going out and making purchases ourselves," Dorfsman says.

IBM has made on-demand computing a cornerstone of its technology strategy, committing $10 billion in resources and investments to the idea.

One of the underlying management technologies that eventually will enable IBM to deliver on-demand computing is its Utility Management Infrastructure (UMI), which was code-named Blue Typhoon while in development by IBM Research. Unveiled in December, UMI consists of tools and software for tying together disparate hardware, such as different brands of servers and storage devices, without requiring new applications to be written for each system, IBM says.

Sun with its N1 initiative and HP with its Adaptive Infrastructure also are pursuing pay-as-you-go computing models.

Summit Strategies' Kucharvy says other industries will likely follow the lead of financial services companies — which traditionally are early IT adopters — as demand-based outsourcing services mature. ■

Outsourcing wins

The JPMorgan Chase deal topped IBM's five largest financial services outsourcing wins for 2002.

1 **JPMorgan Chase, New York**
$5 billion over 7 years
Announced in December
IBM will manage much of JPMorgan Chase's technology infrastructure, including data centers, help desks, distributed computing, and voice and data networks.

2 **American Express, New York**
$4 billion over 7 years
Announced in February
IBM manages American Express' computer systems, from mainframes to desktops, and its Web hosting, database administration and help desk operations.

3 **Deutsche Bank, Frankfurt, Germany**
$2.6 billion over 10 years
Announced in December
IBM will manage Deutsche Bank's computer centers in Europe.

4 **DBS Bank, Singapore**
$679 million over 10 years
Announced in November
IBM will handle data center consolidation in Singapore and Hong Kong; help desk support; some application management; and systems management.

5 **Manulife Financial, Toronto**
$563 million over 10 years
Announced in April
IBM supports Manulife's North American data centers, help desk operations, desktop computers, and voice and data networks.

Content delivery market set to soar

■ BY PHIL HOCHMUTH

Industry watchers expect corporate content delivery networks to take off this year as businesses exploit the technology for more than multimedia delivery and Web page caching.

In addition to using CDNs for delivering multimedia content such as e-learning and corporate communications, companies will use them for applications such as transferring sales updates or other data to remote offices and business branches, analysts say.

CDNs rely on Web caching and load-balancing technologies to efficiently deliver large amounts of data over a WAN. CDN technology gained prominence through services offered by companies such as Akamai and Inktomi that aimed to alleviate congestion at popular Web sites.

But the majority of businesses that use CDN technology have chosen to implement the networks rather than go with a service provider, according to Henry Goldberg, a senior analyst with Instat/MDR.

"The largest traditional application [for CDNs] is the acceleration of Web site delivery, along with streaming audio and video," he says. "But a fair number of enterprises this year will start to use the technology for distributed computing."

Goldberg says that businesses with dispersed offices or branches — such as retail stores and manufacturing firms — are looking to CDNs as a way to move sales information or inventory data between branches and a centralized data center.

According to IDC, U.S. businesses spent about $300 million on CDN equipment, such as caching hardware, in 2002. The firm predicts that this figure will more than double over the next several years, with the U.S. market reaching $1 billion by 2006.

The market for caching and content delivery products has been tumultuous in recent months. Many familiar names in the market have changed focus (such as CacheFlow's transformation into the security company BlueCoat) or have been bought out (such as Yahoo's purchase of Inktomi last week).

Vendors such as Cisco, F5 Networks, Nortel, Radware and Volera still offer CDN products, which include caching devices, Web switches, and appliances for directing and scheduling content distribution throughout a corporation.

SBC Communications uses CDN technology to deliver multimedia training materials to network technicians. Cisco content management equipment is used to issue training videos and other media to more than 300 locations in the service provider's network.

"Most of our [content network] consists of video on demand," says Jim Runnels, a senior network manager who oversees SBC's corporate WAN. He says CDN equipment is an efficient tool for delivering training videos, or corporate informational Webcasts, to branch offices.

Rather than streaming live Webcasts or making online videos available from a central server, the CDN equipment pushes video content to local offices during off-hours. This prevents network bandwidth from being overutilized and provides better quality, because training videos are viewed locally. ■

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Q A NetScreen CEO talks VPNs

VPN and firewall vendor NetScreen Technologies went public about a year ago and is still alive to tell about it. CEO Robert Thomas contends the move actually has worked out fine, even though the company's stock has lost more than a quarter of its value since the IPO. The cash infusion has helped Thomas grow the business while he says being public has given customers and potential customers confidence about the company's long-term viability. Thomas spoke recently with Network World *Senior Editor Tim Greene about how NetScreen and the network security market are evolving. Here's an edited transcript.*

Where is NetScreen headed over the next year or so?

At the end of 2003, beginning of 2004, you'll see this new level of security gateway with very tightly integrated intrusion prevention and firewall in the same chip, in the same software, on a new platform. You'll see other improvements at the application level, digging deeper into the packet at Layer 7, looking more closely at the content to pull out things that are malicious beyond what a firewall can do at Layer 3 or Layer 4. You'll see an integrated management platform where we integrate intrusion detection/prevention, firewall, VPN. You'll see some level of third-party management capability on our platform as well. You'll see the silicon that's in the NetScreen 5000 descend down the range into the other products.

What do you make of the Secure Sockets Layer [SSL] remote-access market?

It's a niche thing that's useful to a lot of people. I'm not sure that there's enough revenue in it for a company to be just an SSL remote-access company. It definitely is a simpler and easier way of providing secure remote-access connections. The software VPN client is a more complex and difficult-to-manage environment for remote access. I don't ever see SSL replacing site-to-site VPNs.

How necessary is it for IP Security [IPSec] VPN vendors to have the SSL base covered?

It will be the de facto remote-access part of VPN solutions. It interacts nicely with IPSec VPNs.

IPSec VPNs are drifting toward commoditization, aren't they?

The remote-access part, absolutely. Site-to-site, I don't think so. People need more functionality in a site-to-site environment. This is an always-on connection linked into a network as if it were on the local-area network. You need the right kinds of controls and policy access and all the rest. If you looked at a 1,000-node site-to-site VPN, which might have 800 or 900 telecommuters in it, that's a million-dollar deal, and it needs good solid management tools. You've got to treat it as part of your network as if it were sitting on the LAN, and manage it that way and manage access. Then you're faced with the challenges of the data coming over the public network, so it adds another dimension. It's not commoditized at the moment. It's not a simple network to deploy; it's quite complex.

If it does drift toward commoditization, where does that leave NetScreen?

Our objective is to be the No. 1 network security company, and there are many elements to network security. VPN is one of them, and today it's 60% of our business. We need to add more functionality in the security space to what we do. We'll embed and integrate functionality where we think we can be best of breed. We're not really going to play the Symantec model where you integrate as much stuff as you can into a single box. You end up with best and worst of breed when you do that.

Some vendors, such as TippingPoint Technologies, seem to want to throw everything onto one platform. Are you headed that way?

No. We'll put the pieces on that we think make sense, and some pieces don't. Does it really make a lot of sense to have content filtering, VPN, firewall, intrusion detection, SSL acceleration all on one box? Or does it make more sense to have some of that on one box and others in other parts of the network? I guess that's a judgment call.

You say there's no leader in the IPSec VPN market, but share numbers always seem to show Cisco, Check Point Software and NetScreen. So why do you say there's no leader?

The numbers are a little distorted. Some of the numbers get reported for functionality that ships in a box whether it's turned on or not, and so the numbers don't accurately represent deployments. They more represent shipments. I don't know how that changes, to be honest with you, because the way it's reported will continue to be the way it's reported for a while to come. We see Cisco more often than we see Check Point in a VPN deployment. We certainly see Check Point a lot when it comes to firewall sales. So I kind of wonder about Check Point.

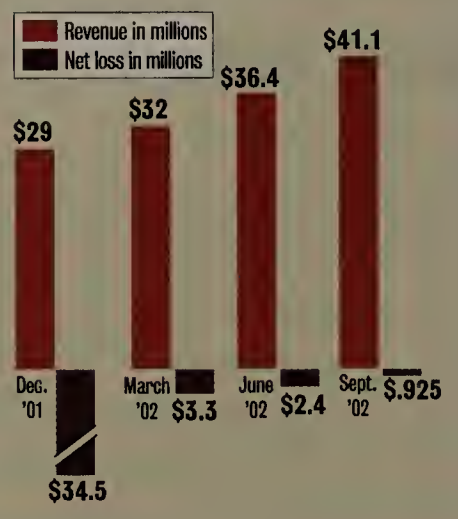
What about Nortel?

They would be the third guy that we would run into. I don't think we see anyone else at all. ■

Financial picture

NetScreen's stock price has dipped since the company's IPO about a year ago . . .

. . . despite constantly improving revenue and reduced losses.



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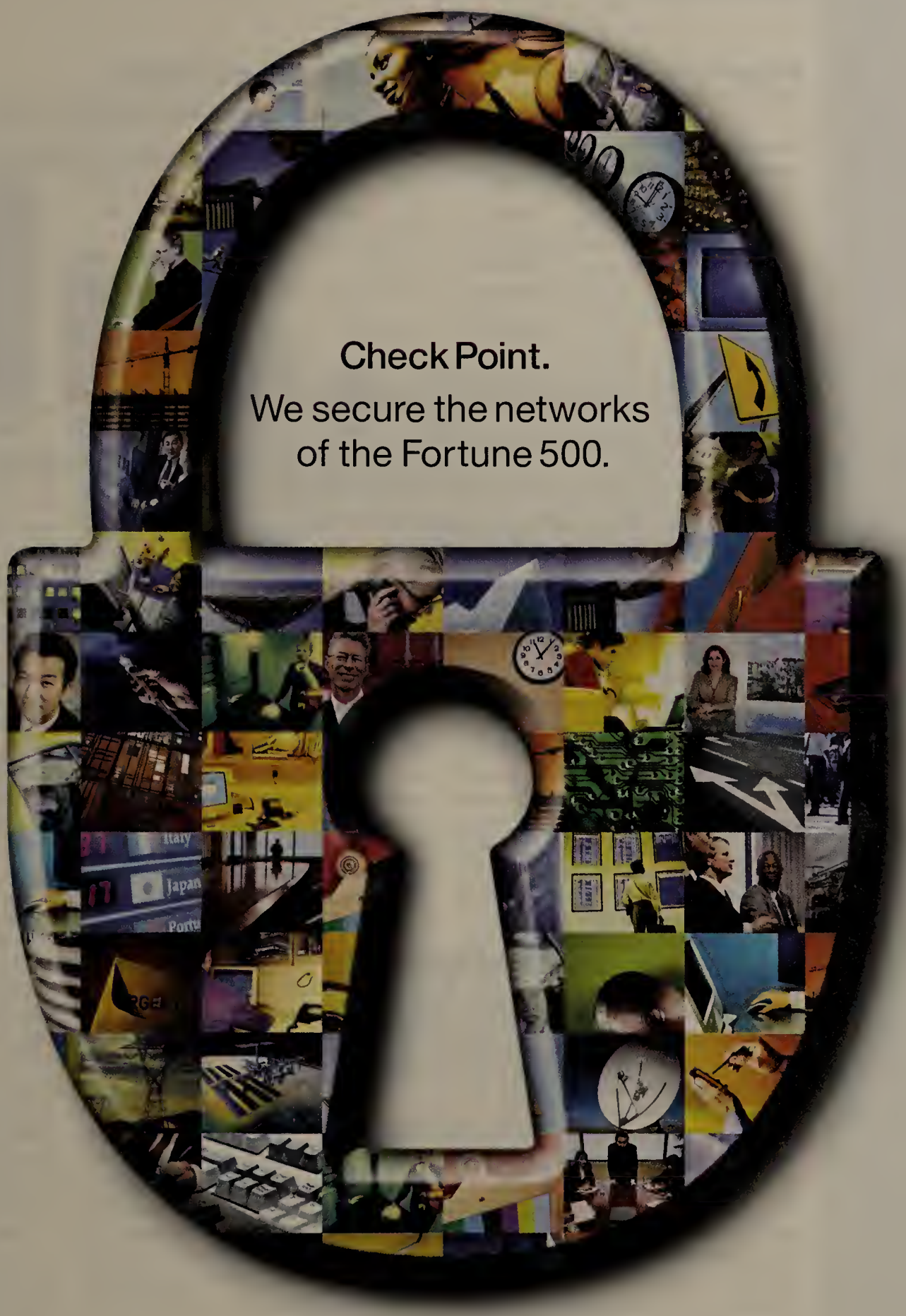

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IP spending

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Before year-end data was available, RHK said it expected Internet traffic in North America to grow 85% in 2002. RHK also reported that carriers' IP-related revenue would be flat at $15.7 billion. RHK said the revenue per bit for IP traffic would decline 46% in 2002, similar to the 45% decline recorded in 2001.

Although $15.7 billion for IP revenue sounds like a lot of money, it represents less than 5% of total service provider revenue in North America, analysts say.

IP applications on the rise

Sixteenfold growth is predicted for popular IP apps.

Total estimated North American IP applications services revenue*, 2002-2007 (in millions)

*Data includes six IP services: audio conferencing, videoconferencing, Web/data conferencing, follow-me services, instant messaging and unified messaging.

SOURCE: INSIGHT RESEARCH

These trends are certainly visible at Fish & Richardson, a Boston law firm with one of the nation's largest intellectual property and trademark practices.

In the late 1990s, Fish & Richardson scrapped a frame relay network that connected its eight offices and provided access to its accounting and e-mail systems in favor of emerging Internet-based VPN technology. This summer, Fish & Richardson returned to frame relay for several key applications, including accounting, e-mail, document management and videoconferencing. The IP VPN has been relegated to providing local Internet access and document filing with government agencies.

"We wanted the speed and reliability of frame relay for our core applications," says Loretta Auer, CIO at Fish & Richardson. "We also liked the privacy aspect of frame relay and the reduced latency."

The two networks serve as backups for each other to improve overall reliability. Best of all, Fish & Richardson cut its data network costs 30% by migrating some applications off the IP VPN back to frame relay, Auer says.

"Lots of people went to VPNs thinking that they were less expensive, but we found the life-cycle costs to be higher," Auer says. "By going with frame, we are actually saving money. Plus, we've got a significantly more capable network."

Fish & Richardson is not alone. Many U.S. companies are slowing their transition to IP networks and instead squeezing new life out of investments in legacy technologies.

"The economic downturn has not helped the case for IP networks," says Vinay Rathore, director of strategic markets for Alcatel's Broadband Network Division. "Companies are no longer willing to take the risk of being the first one to adopt IP. ATM works. Traditional voice works. They don't see the compelling business case to jump to applications like voice over IP [VoIP] because the cost savings are not all that great. What they have works fine for now."

Promising applications

For corporate network managers, the most promising IP applications are generally VPNs, videoconferencing and unified/instant messaging. Carriers report that sales of these IP services are growing — but not as fast as previously anticipated.

The top six IP applications services — audio, video and data conferencing, instant messaging, unified messaging and follow-me services — were expected to top $695 million in sales in 2002 in North America, according to Insight Research. By 2007, those six services should account for $11.4 billion in revenue, Insight Research predicts.

Even though these six IP services are poised for sixteenfold growth, at $11.4 billion they represent "only about 2% of total telecommunications service provider revenue," says Robert Rosenberg, president of Insight Research.

"For carriers, voice still pays the bills," Rosenberg says, adding that it will be several years before all IP services revenue accounts for even 10% of overall carrier revenue.

That's why industry observers say the real shift to IP services will come when companies start migrating the bulk of their voice traffic to IP backbones.

The shift to VoIP is happening more slowly than observers predicted two years ago. Insight Research says VoIP spending will have reached $7.3 billion when final 2002 tallies are known, down 10% from the $8.1 billion estimate made in 2000. Today's $7.3 billion VoIP investment represents less than 5% of total voice expenditures, Rosenberg says.

The attraction of IP is that carriers can "operate more efficiently than with other packet networks. Operational costs will be a whole lot less and service creation will cost less," Rosenberg says. "But the carriers today are not investing for new revenue opportunities or new service creation opportunities. They're investing for cost avoidance.... It's going to be five to seven years before we see a major move to next-generation networks."

Lower legacy prices

One reason corporate network executives are migrating more gradually to IP services is that the prices for legacy data services such as frame relay and ATM keep dropping.

"Frame relay prices have come down 10% a year for the last five years," says Brett Machtig, a consultant with Telwares, a consulting firm that helps corporations negotiate contracts with carriers. "If the carriers try to start increasing legacy rates or holding them constant, that will speed up the shift to newer technologies like IP as long as they're reliable and they work."

Network equipment vendors such as Alcatel and Nortel are responding to this trend with multiprotocol switches that carry IP, ATM and Multi-protocol Label Switching traffic in a single platform. These systems give carriers more flexibility to respond to corporate customers as they move gradually to newer IP services.

"Two or three years ago, carriers never anticipated that they'd have so much revenue still coming from frame relay," says Jim Guillet, assistant vice president for switched data services at Alcatel's Broadband Network Division. "Our 7670 router/switch platform provides an evolutionary path so carriers can build out their network infrastructures to support continuous growth of frame relay and IP."

Without a significant price advantage to IP, many corporations are migrating on an application-by-application basis rather than switching completely to a new converged IP backbone.

"The different WAN technologies are going to co-exist," says Steve Harris, research manager for IDC. "There are some companies that are ditching frame relay altogether. IDC is one that is doing that. But most companies aren't."

Sprint is seeing a resurgence in frame relay sales to corporate customers such as Fish & Richardson.

See IP spending, page 13

Mixed results

While Internet traffic was up

85%

last year, revenue per bit paid to carriers for IP traffic was down 46%, according to RHK.

Correction

■ In the story "Core competency" (Dec. 16, page 48), the unit of measurement for jitter should have been in milliseconds. The maximum jitter for all seven ISPs was in excess of 100 milliseconds.

IP spending

continued from page 12

"There was a point where there was little or no growth in the frame relay platform for a period of 12 months, but that has since ticked back up," says Barry Tishgart, director of data product management for Sprint's Global Business Markets Group. "The IP platform is not growing at as high a rate as 24 months ago, but it's still pretty impressive, healthy growth."

With many IP-centric service providers in a financially distressed state, traditional carriers such as AT&T are outpacing the industry in IP traffic and revenue growth. Rose Klimovich, general manager of AT&T's Managed Internet Access Services, said last month that AT&T's IP traffic would double in 2002 and its IP revenue would be up 26% compared with 2001.

"We're seeing significant growth in dedicated access, hosting services and VPN services," she says.

Selective transition

Still, Klimovich concedes that many companies are happy with the frame relay and ATM services they have. These customers tend to move only select or new applications to IP rather than transition their entire WANs.

"Certain applications are better-suited for IP. Anything where you're interacting with other companies is easier to do on an IP infrastructure," she says. "But if you have an application that's behaving well where it is and you have a contract in place, you'll probably let it be."

Despite the rapid growth of its IP traffic, the shift from legacy technologies to IP is happening more slowly than AT&T anticipated.

"Overall both [the IP and frame/ATM] markets are smaller than we said they'd be two years ago," Klimovich says. "But there's more jostling around among the carriers in terms of who is getting most of that growth."

VPNs hold promise

For carriers, the killer application for IP might be VPNs. A recent IDC survey of 400 companies found that half had an IP VPN and another 21% had plans to implement one in 2003. Of the companies that have VPNs, 75% were managed in-house, opening a major opportunity to carriers that can attract that business.

"We see IP VPNs playing in 40% to 50% of corporate users' strategic plans in 2003," Tishgart says. "Clearly, the CIOs are asking their staff to have a plan to go to IP services."

Global Crossing is one carrier pinning its hopes on attracting corporate VPN traffic. Having spent the last year restructuring its finances, Global Crossing plans to relaunch a managed IP VPN service next month. The company in December announced a managed frame relay/ATM VPN.

"We're looking at a fivefold increase in our number of VPN customers, but that's on a small base. We only have 30 customers today," says Anthony Christie, senior vice president of offer and product management at Global Crossing. "The market is there. And it's going to come from us ... demonstrating to enterprises that VPNs are a stable technology and getting rid of the mystique with network-based VPNs."

Despite its financial problems, Global Crossing says its overall network traffic will increase 200% this year, up from 100% growth in 2001. Its most popular IP services are high-speed Internet access and transit.

"IP services were about 2% of our revenue mix in 2000, 4% in 2001 and increased to 6% in 2002," Christie says. "Our plan for 2003 is to increase that modestly to be about 8% to 10% of our revenue mix."

Convergence pioneers

While most companies are taking a cautious approach to IP networks, a handful of pioneering organizations such as the U.S. Department of Education are charging ahead with plans for fully converged voice, data and video networks based on IP.

"We have recognized that a fully converged network provides savings, better operational control and a higher level of productivity for the [IT] team," says CIO Craig Luigart. "That's what's driving us in this direction."

Faced with moving 1,000 users to a new building in Washington, D.C., the Department of Education decided to install an IP network that supports VoIP, data and video transmission. The department worked with IBM and Cisco to design the network, which has operated for more than a year.

"We spent around $2 million for the cost of all the hardware plus labor and installation," says Deputy CIO Rick Miller. "But we would have had to spend around that much to buy PBXs, telephones and separate wiring for a traditional telephony infrastructure. . . . With the hardware cost, we were breaking even."

Miller says the department has seen cost savings in its ability to bypass long-distance tolls. Even more significant are the savings that come in network administration for new employees, departing employees and employees who move from one building to another. (For more on the Department of Education's VoIP project, see www.nwfusion.com, DocFinder: 3748.)

"A fully converged network provides savings, better operational control and a higher level of productivity for the [IT] team."

Craig Luigart
CIO, U.S. Department of Education

VoIP success

The VoIP project has been such a success that the Department of Education is considering how to migrate the rest of its 5,500 users at its headquarters and 10 regions to the technology. The department plans to piggyback installation of VoIP on already-planned building renovations in some regions.

"A year from now we'll have 40% of our users on VoIP, and in another two years we'll be close to 100%," Miller says. "The converged network architecture gives us flexibility, better response times for users, control over our telephony systems, back-end savings and toll bypass savings."

Carriers, equipment providers and other Internet industry players are counting on other enterprise network managers to come around to the same way of thinking.

"We've had 12 to 18 months of corporate belt-tightening, but now applications are growing again and there's a desire to add more bandwidth," Sprint's Tishgart says. "The outlook for IP services is improving. . . . We see increased demand for Internet access in the enterprise." ■

More online!

IP-related spending isn't the only IT area expected to take a hit in 2003. See what network executives foresee for their budgets this year.

DocFinder: 3749

Sofware battle

continued from page 1

on Windows and its broad .Net umbrella for integration. And each has a prizefighter's eye for pinpointing the other's glass chin.

"Software is an engine for IBM's services organization and I don't think their software is easy to use, and I don't think it is easy to integrate," says Paul Flessner, Microsoft's senior vice president for .Net Enterprise Servers. "It works once you put it together, but it takes 140,000 people worldwide to make that happen. That is not the case for Microsoft software."

Steve Mills, IBM's senior vice president for software, says Microsoft is one-dimensional. "Microsoft is a great marketing company and they generate a lot of attention and a lot of imagery around what they do, and in particular what they intend to do," Mills says. "But the one-size-fits-all notion is naive."

The war of words is part of a complex relationship between the companies. Over the past year, they have collaborated on defining security and workflow standards to help jump-start Web services. IBM is a top reseller of Windows, and Microsoft partners with IBM's large service organization.

The two basically created the PC revolution in the late 1980s before a fallout resulted in Microsoft building a monopoly with Windows and IBM's OS/2 becoming an afterthought.

Stage set for battle

Now with the broadest software portfolios in the industry, the companies are set to clash. The stakes will be high as Windows and Microsoft development tools based on .Net and Java 2 Platform Enterprise Edition battle IBM's WebSphere and Linux products. Messaging/collaboration servers, databases, management and security products also will be key competitive arenas.

IBM is entrenched in large companies that need to integrate across platforms internally and externally. Microsoft excels with companies ranging from 100 to 1,000 employees, as these midmarket types are attracted to ease-of-use and low-cost software.

Each wants to maintain its dominance while stealing a slice from the other.

To achieve that, experts say, IBM will have to exploit its cross-platform strengths and overcome the challenges of integrating its stable of software products built through acquisitions — it bought seven software firms in 2002 — and cater to midmarket companies without hiding behind an army of consultants.

"IBM has to make its software easier to use and put together simple packages so it can grow into the small to medium-sized business market," says Tom Bittman, an analyst with Gartner.

Microsoft on the other hand has to again springboard off its strong development tools and depth of operating system services while proving it has the security and scalability to support enterprise-class applications. The company also must convince users to commit core infrastructure to Windows all the time.

"Microsoft has to move into the enterprise data center and that has been tough for them," Bittman says.

In April, Microsoft will make its best data-center effort to date when it is expected to ship a 64-bit version of Windows called .Net Server 2003 and a 64-bit version of SQL Server, both designed to handle top-tier corporate applications.

The companies are throwing all they have into the battle.

IBM has 40,000 people working on software and is dedicating almost half of its $5 billion research and development budget to developing middleware to integrate Web-based commerce, Web services and applications. It's a strategy key to IBM's future success as both its services and hardware revenue are flat, and those businesses are producing rail-thin profit margins. Conversely, IBM's fiscal third quarter in 2002 showed software contributed 15% of revenue but 34% of profit.

In 2003, IBM will push its middleware portfolio by expanding its 10,000 member salesforce by 5%.

Microsoft's financial commitment is on par. The company's research and development budget will increase by 20% in fiscal 2003 to $5.2 billion, with about $2 billion earmarked for its line of 13 .Net servers, such as a new technology debuting in SQL Server that could become the foundation of a universal file system.

Microsoft will increase by 22% the headcount and dollar investment in its server platform salesforce this year in an effort to understand the sales cycle in the enterprise server market, which differs so dramatically from the desktop model Microsoft used to build its current $40 billion cash reserve.

Microsoft CEO Steve Ballmer says the server platform business is being counted on over the next five years to significantly increase cash flow, as Microsoft's dominant profit makers — client desktop operating systems and Office — struggle with market saturation.

WebSphere key for IBM

On the product side, IBM is using its WebSphere platform as the anchor of its middleware portfolio that features the DB2 database, Lotus collaboration software, and Tivoli management and security tools.

IBM hopes to use WebSphere as the platform for enterprise application development and integration in an effort to make a commodity of the operating system that is key to Microsoft's strategy. IBM also is counting on Linux support across its hardware lineup to eat away at the Windows franchise.

"You can build your application principally anchored to the middleware layers and use the middleware runtime to shield you from operating system differences," says IBM's Mills, who helped IBM acquire Rational Software in December for $2.1 billion to pressure Microsoft in the development tools area. "That is a powerful value proposition for application portability and interoperability."

On the other side of the fence, Microsoft is making no bones about its leading punch.

"If Windows doesn't win, then we don't win," Flessner says. "We know that, and that is the cornerstone of our strategy."

And it is a proven one against IBM.

After a six-year battle for dominance in messaging and collaboration, where the majority of servers run on Windows, Microsoft Exchange has almost 40% of the market compared with about 35% for IBM/ Lotus, according to IDC. In the database market, IBM's DB2 is king with 36.5% compared with Microsoft's 13%.

Microsoft's integration story is centered on Windows, including BizTalk Server, for XML transformation and business process orchestration, and Host Integration Server for mainframe connectivity. And the company is relying on Web services and .Net as a standards-based link to other platforms as a way to let customers tie in non-Microsoft products.

"Microsoft is using Web services as the 'get out of jail card' for its proprietary Windows world," says Dwight Davis, an analyst with Summit Strategies.

Running the gauntlet

IBM and Microsoft also are throwing down the gauntlet in other areas.

In the midmarket the pair differs in that IBM plans to partner extensively to push its Express middleware to smaller companies on the back of applications from business partners and independent software vendors, such as makers of CRM and ERP products.

Microsoft formed a Business Solutions division in fiscal 2003 and is entering the ERP and CRM markets with its own applications and high hopes of profit growth after losing $68 million in the division's first three months of operation.

Each company has its own philosophy on services. In August 2002, IBM spent $3.5 billion to acquire PricewaterhouseCoopers Consulting and establish itself as a leader in IT services with 55,000 employees and $13 billion in revenue. Microsoft relies on partners and its Microsoft Consulting Services (MCS), which caters to large customers. But Microsoft has no plans this year to expand MCS beyond its 4,000-plus employees, according to Flessner.

"We are a software company. We'll let our partners make money on services," he says.

But even with all the battlefronts, observers say the IBM/Microsoft war might not have a clear winner.

That's because there are plenty of companies that act like Fortis Health in Milwaukee. The 110-year-old company and the oldest national health insurer recently consolidated some of its applications on the Windows Datacenter platform to save millions of dollars, but it also maintains two mainframes and a slew of Unix servers.

Fortis CIO Roger Jones says, "Our decisions will continue to be cost-based and will focus on where we can get the performance that we need."

In Part 2: Microsoft isn't the only target on IBM's radar. Next week we look at IBM strategies for future growth in everything from autonomic computing to software for small to midsized corporations.

The keys to the kingdom

IBM and Microsoft have some key strengths and weaknesses in their efforts to dominate the corporate software arena.

IBM

Strengths

- Strong enterprise partner.
- Strong one-stop software and hardware shop for most customers.
- Financing, especially for large-scale implementations.

Challenges

- Improving its record with small/midsized business problems.
- Effectively integrating recently purchased technology. If the economy doesn't turn around or if a particular technology doesn't make money quickly, IBM may cut it loose rather than continuing to invest in it.

Microsoft

Strengths

- Desktop and server software industry leader.
- Financial position.
- Strong position in small to midsized businesses.

Challenges

- Improving licensing issues.
- Improving security, especially for the data center users Microsoft covets.
- Working to get corporate users onboard with Windows Datacenter.

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InSite: Lessons from Leading Users

Healthcare group picks on SSL for remote access

■ BY TIM GREENE

Secure Sockets Layer-based remote access has been just what the doctors ordered — and more — for Virtua Health in Marlton, N.J.

The company, which operates four hospitals and two clinics, was looking to simplify doctors' access to network resources after a standard browser upgrade made the existing system unworkable.

Installing an SSL remote-access system from 3-year-old start-up Netilla has given doctors the access they required. What's more, it has helped Virtua slash its software licensing costs, provide more employees with intranet access and more than doubled the number of applications available to remote users.

"We're finding new uses for it all the time," says Andrew Gahm, Virtua's network architect.

The Netilla Service Platform relies on the SSL technology found in most Web browsers and used to protect Internet credit card transactions. Rather than granting access directly to servers, databases and other resources protected by corporate firewalls, Virtua has situated the Netilla appliance behind the firewall, where it provides access to protected company resources over the Internet via SSL.

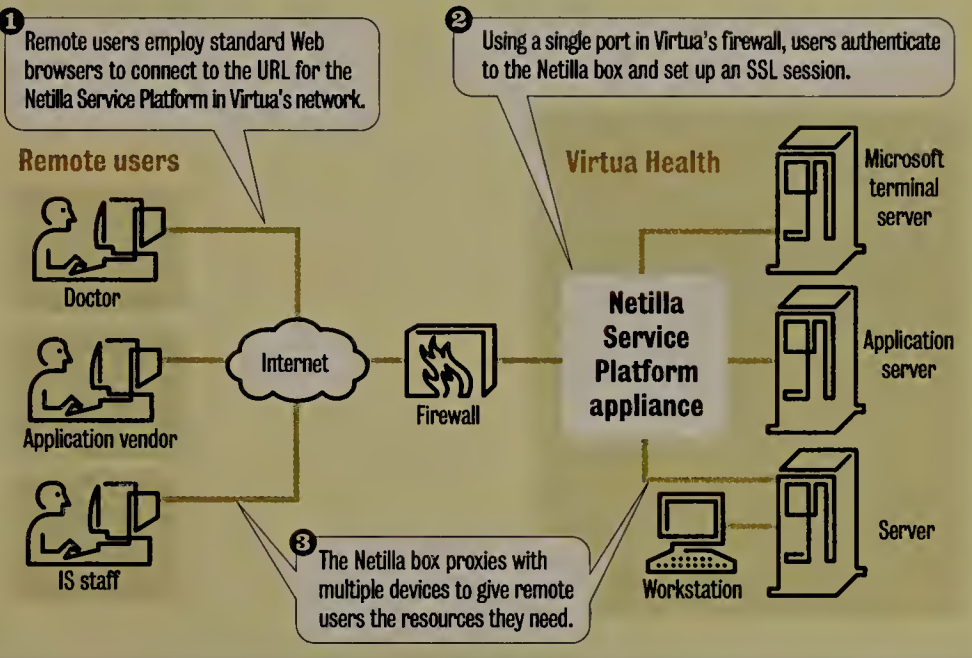
Virtua looked into Netilla because 400 physicians and other users were having trouble accessing the Siemens Shared Medical System (SMS) healthcare application they were used to reaching by Web browser.

The problem arose last year when many doctors upgraded their browsers to Microsoft's Internet Explorer 6.0, which was not supported by the SMS application or the VeriSign digital certificate used to authenticate remote

See SSL, page 18

Remote-access Rx

Virtua Health is using Netilla's SSL-based appliance to streamline remote access to network resources.



Software helps users consolidate servers

■ BY DENI CONNOR

Large businesses are beginning to use software that lets them consolidate applications and operating systems onto as few Intel-based servers as possible, easing administration and lowering costs.

Known as server virtualization, the technology promises to let customers divide the server and create independent environments that can run different applications and operating systems on the partitions or processors of the Intel server. Companies, such as Connectix, SW-Soft and VMware are providing the software that lets Intel servers emulate the software partitioning and virtual machine capabilities of bigger Unix servers from Hewlett-Packard, IBM and Sun, and mainframes from IBM.

There are two types of server virtualization techniques in Intel machines — virtual machine and virtual server. In a virtual machine environment, multiple operating systems run side by side on the individual processors or partitions of the server. In virtual server environments, one operating system is virtualized across the partitions and processors, where it can run multiple applications. With virtualization software, a customer could run an e-mail application on the Windows partition while running a Web server under Linux, or run several lightweight applications such as calendaring or mail on a Linux virtual server environment. Without server virtualization software, it would be necessary to add servers as the number of applications grew.

The desire to consolidate servers is growing, too. IDC predicts that 75% of large corporations will consolidate portions of their servers or storage this year. The research firm says the Windows NT/2000 market will see more than $1.3 billion spent on consolidation; Linux consolidation will top $232 million. By 2006, consolidation in the Windows NT/2000 market will more than double to $2.7 billion.

"We are trying to reduce the number of overall servers we use," says Randy Robinson, vice president of IT for Unum Provident, the world's largest disability insurance provider, in Chattanooga, Tenn. The company's server farm has grown by 50% over the past two years.

"If we have a team that wants to develop an application, typically we will need new servers for development, testing and training," he says. "With virtualization, we can take a two- or four-processor server and create multiple instances of the operating system, which allows us to segment and partition our development, training and testing activities, without having a negative impact on someone else."

Meanwhile, Chris Schuttger, infrastructure architect for TXU, an energy services company in Dallas, is using virtualization software from VMware to better exploit the resources of the bigger IBM servers he is buying.

"As the industry makes faster and faster processors, a customer can buy a single processor machine with a lot of headroom they won't ordinarily use," Shuttger says. "If I can buy a four-processor system that can be partitioned with

See Server, page 18

Short Takes

■ **RLX Technologies** launched a faster, low-power server blade in December that runs at 1 GHz and is based on the Transmeta Crusoe processor. The **ServerBlade 1000t** will replace the 667MHz model, the ServerBlade 667. Up to 336 servers can fit in a standard rack and as many as 24 blades can fit in an RLX chassis. Each server blade supports a capacity of 120G bytes and can be configured with 128M bytes of double data rate memory and as much as 1G byte of synchronous DRAM. The Transmeta ServerBlade 1000t starts at $1,330 per server. It runs Windows and Red Hat Linux and is available now. The RLX 300ex chassis costs $3,300. www.rlx.com

TOLLY ON TECHNOLOGY

Kevin Tolly

Enterprise technology tips for 2003

Ah, a new year, so filled with optimism that we can deploy voice over IP, wireless and Gigabit Ethernet with nary a hitch. At least, that's what vendor marketing machines are telling us. Let's not forget the mighty words of French philosopher Voltaire: "Those who can make you believe absurdities can make you commit atrocities."

Here are a few tips to avoid network atrocities in 2003:

Voice over IP

While you certainly want to make sure that you get the best quality of service (QoS)-enabled Layer 2/Layer 3 switching infrastructure to support your VoIP installation, the truth is deploying switching gear from any major vendor will get you what you need.

But, while VoIP systems are heavily standards-oriented, many vendors can offer advanced telephony functions only via proprietary extensions to protocols such as H.323.

Be cognizant of the underlying architecture. While all VoIP systems contain the same essential elements, key architectural issues — like centralized vs. distributed control — can have a major effect on the flexibility and resilience of the VoIP system.

And be aware that even the humble IP phone can have an effect on your network. Geeky issues such as how they handle (or if they handle) 802.1p and/or Differentiated Server priority as well as how they deal with dead air (aka silence) on voice calls can become very important when such little things are scaled to thousands of users.

Wireless LANs

While it's easy to let wireless segments just grow out of the edges of your wired segment — that's not a good idea. You need a full understanding of the role that campus wireless will play in your organization and start building that environment from access point No. 1.

Realize that wireless is a shared environment. While you can run VoIP over IP over wireless — you cannot guarantee the treatment that traffic will receive. Unfortunately, wireless is a shared environment so our standard methods for QoS that we use on dedicated switch ports just don't apply.

There are some ways to provide QoS but they require deployment of wireless gear that is not standards-based or the addition of a traffic shaper in front of the access point.

Worried about security and how terrible wired equivalent privacy (WEP) is? Well, it isn't that terrible. Better yet, "WEP+" is coming out in the spring, but it's not called that. WEP got such a bad name that the industry decided to give the new, improved WEP a new name — wireless protected access.

Gigabit on Campus

There are two parts to this — Gigabit to the desktop and 10-Gigabit in the core.

In 2003, Gigabit network interface cards (NIC) will be basically free. Buy PCs from Dell, HP/Compaq, IBM and others and you'll find that, like-it-or-not, they'll come with a 10/100/1000M bit/sec Ethernet NIC on the motherboard.

If only the switch ports were free. Unfortunately, they're not. While prices vary, they are still several times more expensive than Fast Ethernet ports. So don't expect to use a lot of those new PCs at Gigabit speeds right away. It seems like switching vendors are hoping that pressure from the edge pushes the desktop to Gigabit. Vendors: Lowering switch port prices wouldn't hurt.

And all that Gigabit at the edge will have you begging for 10G Ethernet at the core, right? At $50,000 per port (meaning $100,000 per connection), you might find yourself, instead, suddenly very fond of link aggregation. In 2003, it will still be a lot cheaper to aggregate six or eight Gigabit links than to buy 10G Ethernet ports.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com.

In Site: Lessons from Leading Users

SSL

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users. Doctors rejected the workaround of reverting to Internet Explorer 5.5 and using proprietary Siemens security tokens.

The Netilla box can set up secure links with Internet Explorer 6.0 and proxy to a Microsoft Terminal Server containing the SMS Web page, solving the problem.

Once Virtua installed the Netilla gear, it wasn't long before the company discovered other uses for the product. These include using it as a less-costly alternative to expanding its use of Citrix's thin-client-based remote-access technology.

Virtua has used Citrix's Web-based ICA client software to give some employees easy access to a handful of networked applications, such as those from PeopleSoft and Per-Se Technologies. Citrix software on remote machines and the servers being accessed lets end users run Unix, Windows and Java applications that are located on servers in Virtua's network.

But expanding its use of Citrix would have required purchasing secure gateway software that would cost more than the $40,000 to $50,000 Virtua already had spent on its Netilla box, 400 simultaneous user licenses and a maintenance agreement, says Tom Pacek, assistant vice president of technology for Virtua. With the Netilla technology Virtua has increased the number of applications it makes available to end users from between 10 and 25 to more than 50, he says.

Another benefit of the Netilla setup is that Virtua has tightened security by cutting the number of firewall ports left open, Gahm says. Before Virtua bought the Netilla appliance, Citrix users would access the network via one firewall port for authorization and then access the servers running the desired applications through other firewall ports. "All our Citrix servers were exposed to the Internet along with the Web page that led you to them," Gahm says. Now those ports are closed, and all traffic comes through the SSL port leading to the Netilla box.

"It made our security consultant very happy because we closed a lot of ports that were open to the Internet," Pacek says. "Not that they weren't secure, it just gave people more opportunity to hit us."

Virtua still is trying to convince some end users who rely on Citrix — or other remote-control software such as pcAnywhere and Carbon Copy — to access Virtua servers to give the combination of a Web browser and the Netilla appliance a try. But Virtua still needs to convince these users that the technology is secure, Gahm says.

Another unexpected benefit of installing the SSL-based appliance is that Virtua has given its 3,000 employees who access e-mail remotely the ability to use the full Microsoft Outlook rather than the more limited Outlook Web client.

Because Netilla can proxy to any Web-based server application, such as Outlook, it makes the Outlook Web client unnecessary, Pacek says.

By virtue of Netilla's gear, Virtua has avoided using IP Security (IPSec) VPNs and the inherent hassles of distributing client software to remote machines.

"Just in playing around with [IPSec VPNs], we had all sorts of support problems with the PC and people changing things on their desktop and causing conflicts with the VPN," Pacek says.

"It became a support nightmare in pilot mode. We decided to go away from the VPN until we're absolutely required to do it," Pacek adds. ■

Server

continued from page 17

software like VMware, I get two things — higher processor capacity and the ability to run multiple applications on one piece of hardware."

Virtual machine technology evolved from IBM's 30-year old, virtual-machine operating environment for S/390 or zSeries mainframes. In virtual machines, multiple operating systems such as z/OS, Multiple Virtual Server or Linux on zSeries run as virtual machines, and multiple applications can be intermixed.

VMware's and Connectix's Virtual Server software are examples of virtual machine environments; they let a variety of operating systems share the same server. SW-Soft's Virtuozzo uses the virtual server model; it lets a variety of applications share one operating system.

VMware has two software models. The company's GSX server, which is based on Windows or Linux operating systems, lets Windows, Linux, Solaris x86 or NetWare run in the partitions. Its ESX server is designed for large businesses and is based on a firmware installed on the hardware called Hypervisor, which also is used in IBM's VM products on pSeries Unix and zSeries servers.

Analysts say that while virtual machine software gives customers the versatility to intermix operating systems on the same server, virtualization technology is not without challenges.

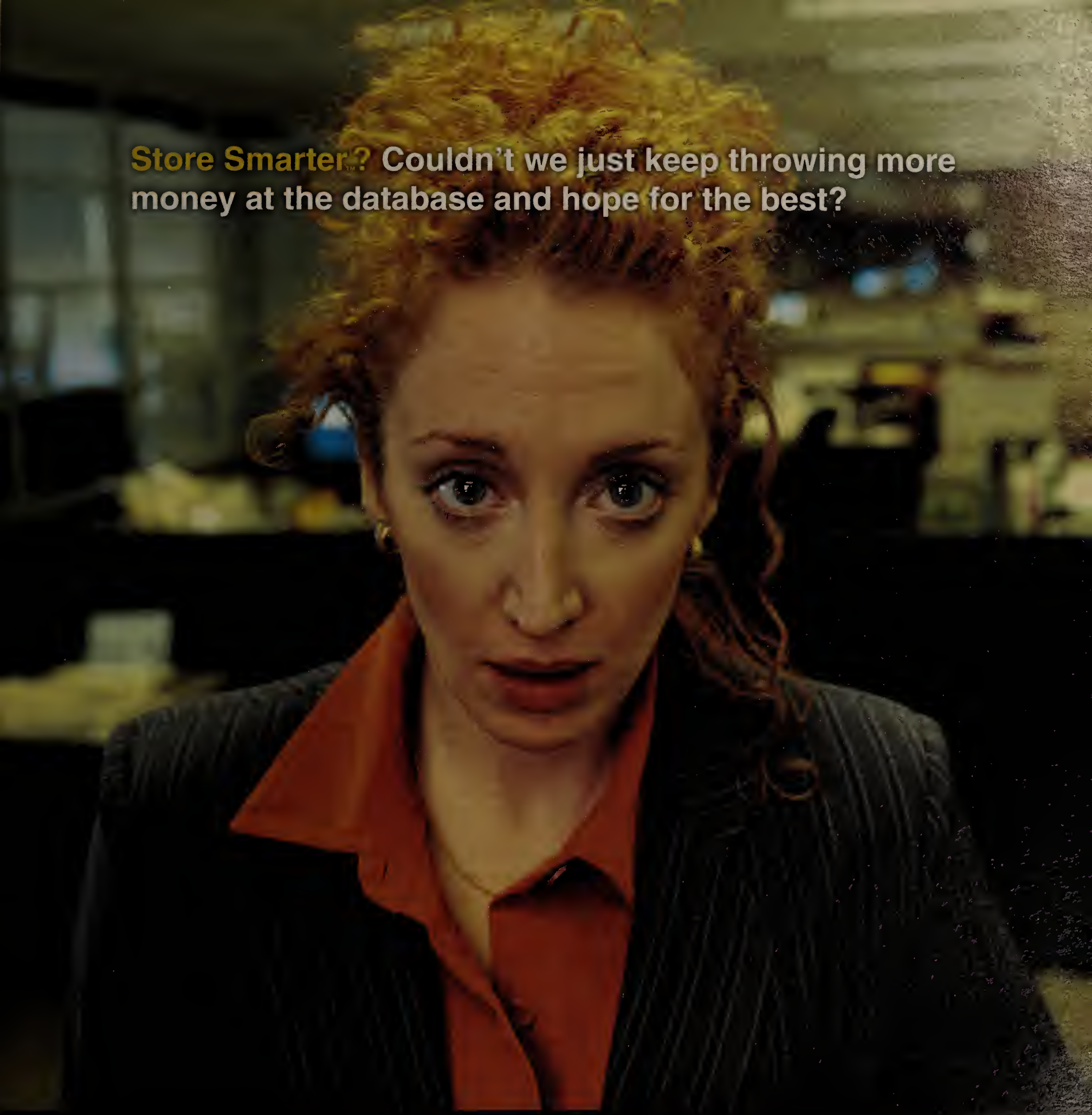
"Reallocating resources and workload management are going to be crucial for customers that want to run multi-application environments," says Jamie Gruener, of The Yankee Group. "Customers need to figure which applications get the most priority in terms of memory, CPU and access to disk. If you aren't able to do that in the short term, you won't be successful."

Analysts say that virtualization schemes that rely on an underlying host operating system, such as VMware's GSX server or Connectix's Virtual Server, could slow application performance.

"Any time the virtual machine needs to communicate with an I/O device, it needs to switch context back to the application running atop the host [operating system], so that the host [operating system] can do the I/O," says Gordon Haff, an analyst with Illuminata, in a research note on server virtualization. "This long I/O path and the associated context switches carry with them a significant performance penalty for applications that characterize many server workloads."

VMware will launch a version of its virtualization software in the first half of this year that lets multiple processors compose one virtual machine. SW-Soft is expected to ship a Windows version of its software in the first half of this year; and, Connectix's Virtual Server software, which is in beta-testing now, is scheduled to ship in the first quarter this year.

Pricing for server virtualization software varies widely. SW-Soft charges per megahertz. Software for a four-processor server operating at 1.2 GHz would cost $4,800. VMware sells its ESX Server for $3,750 per dual-processor server. ■



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Special Focus

CONVERGENCE UPDATE: Packet telephony.

IP telephony set to go the distance in 2003

■ BY PHIL HOCHMUTH

This is the year that enterprise IP telephony hits full stride with advanced product features and more large-scale user deployments, experts predict.

Remote-office resiliency, wireless voice over IP, and expanded server platforms and protocol support are some of the items IP PBX users want — and VoIP vendors say customers can expect — in 2003.

Sales of the equipment reached approximately $1.4 billion in 2002, according to Synergy Research Group, which expects the market to reach $5.2 billion by 2006. Many VoIP companies are now on their third and fourth generations of gear, and large integrators such as IBM Global Services are fortifying offerings with packaged installation and management services for enterprise IP voice.

Support for Session Initiation Protocol (SIP) is on the road map for a few IP telephony vendors in 2003. SIP is an IETF standard that will let customers use IP networks to establish sessions, instead of just phone calls, which could include voice, video or instant-messaging communications. The protocol also can be used in "presence" applications, where users list themselves as available (similar to a "buddy list") via a SIP URL. This allows users to be reached via whatever SIP-enabled technology is available: phone, videoconferencing or instant messaging. Some industry observers see the protocol as the successor to H.323, which is used widely in corporate IP telephony phones and IP PBXs today.

"SIP is the key to the maturation of the IP telephony market," says John Ridley, senior technical architect at Coca-Cola Enterprises in Atlanta, who currently uses an Avaya-based PBX phone network and TDM-based equipment from other vendors.

Ridley says the delivery of SIP by major IP telephony players is something he's been waiting on for a while. "Once the standard is there, then telephony will be like Ethernet ... cheap components that are interoperable," he says.

Several IP PBX vendors have announced SIP-based IP PBXs, including Nortel and Mitel, while others, such as Avaya and Alcatel, have said SIP will be a part of their IP telephony strategy in the near future. Cisco offers a SIP-based phone, but no native support for the protocol on its CallManager phone server.

> **"SIP is the key to the maturation of the IP telephony market. Once the standard is there, then telephony will be like Ethernet."**
>
> **John Ridley**
> Senior technical architect, Coca-Cola Enterprises

Alcatel and Polycom are two companies that have made SIP support a priority for 2003. Alcatel expects to announce support for SIP phones for its hybrid IP/TDM OmniPCX phone switch in the first quarter. Polycom, which had demonstrated a SIP phone at the Fall Voice on the Net conference, will have a production unit available this year. The company also is targeting a SIP-based IP teleconferencing station for release in mid-2003.

Merging wireless and IP telephony

In addition to SIP, some vendors and users will look to merge the worlds of Wi-Fi networks and IP telephony in the coming year.

"802.11 voice will be a very important application for the enterprise," says Bill Rossi, vice president and general manager of Cisco's wireless networking business unit. This marriage would seem logical, by most measures, because Cisco is the market leader in enterprise wireless LAN and VoIP.

"IP telephony is happening in parallel with wireless LAN," Rossi says. "[Enterprise users have] concluded generally that IP telephony is in their future ... they also believe that mobility is important — being productive wherever you are."

Rossi would not say what Cisco's specific plans were for Wi-Fi VoIP. Cisco CallManagers interoperate with wireless IP phones from wireless LAN rival Symbol Technologies and wireless LAN IP phone specialist Spectralink, but some users say a Cisco-branded Wi-Fi phone might be on the horizon.

Mark Carrier, telecom manager at Crate & Barrel in Northbrook, Ill., recently oversaw a deployment of wired Cisco VoIP gear at his corporate office and says he was shown some beta Cisco wireless IP phones, along with Cisco's Aironet wireless LAN endpoint hardware.

"Wireless was something we are thinking about," Carrier says, adding that an IP phone that would let executives roam the building while remaining on the corporate phone — without using up cell phone minutes — could present a productivity and cost advantage.

Avaya also offers wireless LAN IP phones from Spectralink. The company also makes a softphone product that can be used on a PDA.

Beefing up IP PBXs

Other ways vendors will look to beef up their IP PBX offerings are the areas of remote-site survivability and the migration IP PBX software to new server platforms.

Alcatel this quarter is expected to release "survivablity" hardware and software features for its routers and OmniPCX phone system. The new features will let remote Alcatel IP phones — which are tied to a centralized OmniPCX via an IP WAN — to remain working in the event of a WAN link failure.

This concept appeals to John Walsh, telecom administrator for the city of Brockton, Mass., where an OmniPCX recently was installed to support 250 city workers.

"One of the main things we're concerned about is disaster recovery," Walsh says.

While he is working on getting the city up to speed with the basic features of the OmniPCX installed in Brockton's city hall, Walsh already is thinking about how to provide back-up phone access to remote workers. "If we lost connection to city hall, it is essential for us to be able to keep phone lines up and running at other offices," he says.

IP telephony in 2003

Trends to look for from enterprise IP telephony gear makers:

- **Platform expansion**
  Some vendors will look to move their IP PBX platforms off of Windows-based servers and onto boxes running Linux, Unix or even proprietary systems.
- **Wireless VoIP**
  Makers of IP telephony gear will embrace wireless LAN and cell phone technologies.
- **SIP proliferation**
  Stronger support for SIP, as vendors aim to handle converged applications.

On the issue of resiliency, Siemens says customers of its HiPath line of IP phone servers can expect to see a migration to "sturdier" operating system platforms.

"While not in the next release, we'll be expanding our server offerings for the [HiPath 5000]," says Joan Vandermate, director of product line management for Siemens' enterprise division. This will involve the porting of Siemens' Windows-based HiPath 5000 enterprise softswitch product to platforms such as Sun Solaris and Linux, and possibly a proprietary operating system in the future.

According to Vandermate, the move into Unix and Linux support for Siemens IP PBXs came as a result of customer feedback, mostly from telecom managers who used phone systems that run on Unix-like operating systems. She says Siemens also is looking into developing a proprietary operating system for its IP servers over the next year or so, as a way to provide increased reliability and better performance.

With Microsoft server operating systems, she says, "every time there is a new patch, which is often, we have to test it and certify it with our [IP PBX] software before we can tell our customers to deploy it."

If Siemens had a homegrown operating system for its call servers, Vandermate says, "you'd lose some of the openness that may draw some customers to [IP telephony]," but in the long run, such a platform would be much easier on Siemens engineers and on Siemens customers, she adds.

Avaya is taking a different route, as the company prepares a new platform for its IP telephony applications, based on Java 2 Platform Enterprise Edition and Microsoft .Net.

"We're breaking down our software products into reusable software modules," with the new products coming to market in the first quarter of 2003, says Karyn Mashima, senior vice president of strategy and technology at Avaya.

This architecture will let users distribute call processing, unified messaging, call center routing intelligence and other IP telephony applications across various parts of a network, instead of having all functions in one centralized IP or TDM phone switch. ■

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■ NETWORK MANAGEMENT ■ DIRECTORIES

Short Takes

■ Intrusion-detection systems vendor **Sourcefire** this month begins shipping two new IDS network sensors for use in small to midsize businesses that don't require more powerful gigabit-speed intrusion detection. The **Sourcefire Network Sensor 1000** appliance, which supports up to 30M bit/sec speeds, costs $5,000. The **Network Sensor 2100,** which operates between 250M to 300M bit/sec, costs $13,000. www.sourcefire.com

■ A new plug-in released last week promises to let users of **Alpha Software's Alpha Five Version 5** application and database development tool streamline the process of sending out PDF documents in bulk e-mails. The plug-in component, **Report Mailer,** will sell for $80 and is the first of many that will be released for Alpha Five Version 5, according to Alpha. The company says future plug-ins for the Alpha Five will focus on applications for e-mail and online message boards. www.alphasoftware.com

■ **Freshwater Software,** a subsidiary of **Mercury Interactive,** has bolstered its Web monitoring software to support Web services technologies and transactions. With **SiteScope 7.6,** customers install software on one machine and configure it to remotely monitor Web services and 65 other infrastructure components and applications in the network, eliminating the need to install an agent on every managed machine. Available now, the software supports Simple Object Access Protocol, Dynamic Web Services Description Language implementations and XML Schema data types. SiteScope is available for Windows NT 4, Windows 2000 and Solaris servers. SiteScope also can monitor systems supporting Hewlett-Packard's HP-UX, IBM's AIX, FreeBSD, SGI and Digital Unix. Pricing for the new version of SiteScope, which includes 25 Web services monitors, starts at $3,000. A free evaluation of the product can be downloaded from the company's Web site. www.freshwater.com

Collaborative software ages slowly

Suites of interoperable components will make up future platforms.

■ BY JOHN FONTANA

A revolution is brewing in the world of collaborative software that promises to take network executives away from monolithic collaboration platforms and into a world of reusable components that can be embedded in any application.

The revolution is called contextual collaboration, which means that collaboration tools such as instant messaging, calendars, teamware, Web conferencing and discussion databases should not be separate applications but components with standard interfaces.

Those interfaces would let the components easily be embedded into line-of-business applications, such as adding a Web conference feature into a CRM application, and business processes, such as workflows.

Platform vendors including IBM/Lotus, Microsoft, Novell and Oracle are busy deconstructing their collaboration products into such suites of components — and with good reason.

The concept, which experts say will develop in stages over the next four to five years, lets companies, partners and customers exchange information more efficiently and within the context of their work, such as application sharing activated from within a spreadsheet. It means end users don't have to leave familiar interfaces and open a separate application to collaborate with other users.

Contextual collaboration also cuts the latency inherent in human interaction when phone calls disappear into voice mail or e-mail goes unreturned. It also can reduce the complexity and cost of IT infrastructure by cutting support, management and security obligations. And eventually it will let machines collaborate through workflows that exploit collaboration components.

"This will be one of the biggest information management trends of this decade," says Matt Cain, an analyst with Meta Group, who coined the term "contextual collaboration" nearly three years ago. "And this will be one of the biggest areas of focus for IT."

Software revolution

Cain says the revolution is beginning now as vendors add their own collaboration features into their applications, what Cain calls "collaborative anarchy."

"From an IT perspective this is a nightmare in terms of the amount of infrastructure to support and in providing help desk support for each app. The cost is very high," he says.

"Eventually users will move away from features in point products to a palate of collaborative services supported by IT and made available through development tools and end-user applications," Cain says.

Cain says companies will settle on a single provider of components, likely Microsoft or IBM/Lotus using their market-dominating Exchange and Domino technologies, respectively.

First steps

The first stage of contextual collaboration is seen most notably today in content management and portal software with vendors and third parties doing the bulk of the integration work.

IBM is packaging WebSphere Portal Server with Lotus Sametime instant messaging/conferencing and QuickPlace teamware software, and Microsoft is adding instant-messaging and teamware features to Windows .Net Server 2003.

Other vendors are joining the trend such as 3-D design software developer Parametric Technology, which partnered last year with Groove Networks and its collaborative peer-to-peer software, and Documentum, which recently acquired eRoom Technologies to marry online workgroup software with content management products.

See Collaboration, page 24

Evolution

Meta Group has crafted a road map to corporate adoption of contextual collaboration technologies.

2002–2003:
Companies build out their infrastructures. Components, mostly from IBM/Lotus and Microsoft, address the most commonly used features such as presence information/instant messaging, calendars, Web conferencing and discussion databases but mostly use existing APIs wrapped with the XML-based Simple Object Access Protocol. Vendors and systems integrators use the components to build enterprise products.

2004–2005:
Independent software vendors and bleeding-edge corporate developers adopt a maturing set of components from market leaders IBM/Lotus and Microsoft. Corporate adoption of instant messaging, Web conferencing and teamware is widespread.

2006–2007:
IT gets on-board by taking advantage of mature suites of standardized components integrated with corporate development tools such as Visual Studio .Net. Companies identify processes where they can reduce cost and complexity using contextual collaboration.

BMC upgrades mgmt. tools for DB2

■ BY JAMES NICCOLAI

BMC Software recently pumped out upgrades to five of its SmartDBA management tools for Version 7 of IBM's DB2 mainframe database, along with two upgrades for the distributed, Universal Database edition of DB2.

The products are a further step in BMC's Golden Gate Project, which aims to provide database administrators (DBA) with an integrated set of tools for managing mainframe and distributed database environments from multiple vendors through a single, Web-based console, the company says.

BMC's tools compete with products from vendors such as IBM, Oracle and Quest.

The Web-based console for DB2 UDB is available now. The console for IBM's DB2 mainframe database is scheduled for release in the first half of this year, says Karl Chen, vice president of marketing at BMC.

BMC's tools compete with products from vendors such as IBM, Oracle and Quest.

See BMC, page 24

'NET INSIDER
Scott Bradner

Looking forward by looking backward

What will you think were the big 'Net-related stories of 2003 looking back at it a year from now? I'm not sure they will be much different, other than in degree, than the major stories of 2002.

The copyright mafia will continue to strive mightily to make all of modern technology into a glorified CD player; courts and governments will continue to try to make the Internet into a global force while, at the same time, trying to compartmentalize it into national or subnational chunks; the traditional telecom forces, including standards organizations, regulators, carriers and equipment vendors, will continue to try to protect us from the unpredictability of 'Net-based services; and the cops will continue to see the 'Net as a system for gathering data on citizens.

It is possible that the election-forced changes in the U.S., congressional lackeys will change the fortunes of the copyright industry, but I doubt it. So far, whoever Congress is working for, it is hard to see any hint that it includes the consumers of copyrighted material — you know, the people who would like to buy something like a CD or record a TV show and play the music or watch the show whenever and wherever they want. It will be nice if the U.S. Supreme Court slows down the rush to perpetual ownership but, even if it does, the industry will continue to fight to keep us chattel.

With Australian courts ruling that a statement on a Web site halfway around the world could constitute libel in Australia, the states in the U.S. individually outlawing spam and China mandating an Internet free of confusing (such as antigovernment opinion), it is ever clearer that the Internet presents a serious discontinuity for the world's laboriously accreted legal system. Will there be anyone interested in civil liberties and individual rights involved as the system is rebuilt?

I'm writing this while doing something that some regulators do not seem to think is possible. I'm listening to Internet radio (bluegrasscountry.org right now, khyi.com a little while ago). But some regulators seem to think that the Internet needs to get a quality-of-service (QoS) injection to make this, and Internet telephony, possible.

I've had occasion in the last few days to reread some pundit commentary from the mid-1990s. It was full of the promise of ATM bringing QoS to data networks — QoS that was needed before the Internet could become a success. In spite of the better-than-99%, very-high quality I and others get with Internet radio and on IP-based phones (I also have one of these at home) some folks — mostly those whose businesses are threatened by the Internet as it is — are pushing to get regulations to define IP telephony and to "make sure it is good enough" (as one regulator told me). It's not broke and does not need fixing.

Far too many governmental authorities and law enforcement folks want to treat the Internet as a testing ground for the removal of all limits on personal privacy. They want to do things with Internet-based communications that would never be even thought about for other types of communications. If this is a prototype — we soon will be required to carry ID cards that broadcast our locations at all times and every word we say or hear. So much easier to protect our freedom this way.

Happy New Year?

Disclaimer: It's accretion-breaking time at Harvard, which could be interesting. But the above insincere New Year's wish is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Collaboration

continued from page 23

The forecasted explosion in contextual collaboration, however, is aligned with the evolution of Web services, which will let vendors and corporate developers offer sets of components with standard interfaces based on XML and the Simple Object Access Protocol.

"You start to break down collaborative services into manageable chunks that can be called from anywhere," says Ken Winell, president of Econium, which develops XML-based applications. "We call these components 'skinless.' The functionality is there, and you can layer them into any interface."

The skinless components alleviate the need for using today's API and software toolkits, an often complex way to program collaborative features into applications.

"If you approach this with XML instead of at the API level, you can expose the collaborative technology to platforms almost instantaneously," says Bob Jackson, director of IT for MWH Global, a Broomfield, Colo., company that designs and builds global infrastructure such as water treatment plants. "Contextual collaboration becomes extremely powerful at that point."

Jackson helped execute MWH's $5 million Knowledge-Net knowledge management portal project three years ago, which incorporates collaborative features based on Lotus Sametime instant-messaging and conferencing services.

> **"We are trying to build around these technologies, but for now we are relying on some pretty talented third parties to help us."**
>
> **Rick Rockwell**
> Director of IT, Harris Miller Miller & Hanson

"We've seen the power of incorporating [instant messaging] and electronic meetings into the portal," Jackson says. "[Using those technologies now] is so efficient."

It wasn't easy to build, however, and Jackson says manpower constraints forced MWH to hire a third-party company to conduct the integration.

Easier access to collaboration

IT executives want to see vendors make it easier to get at collaborative services.

"We are trying to build around these technologies, but for now we are relying on some pretty talented third parties to help us," says Rick Rockwell, director of IT for Harris Miller Miller & Hanson, an engineering firm in Burlington, Mass. Rockwell uses an application from eOptimize called about:time for Exchange Server, a resource and activity management program that ties into the calendar features in Microsoft Exchange and uses Web services to make it available through any application.

"Contextual collaboration is a pretty broad term but it seems what we want to do is put a product like Exchange at the core and build customized collaborative components off of it that make our users work smarter and better," Rockwell says.

And ultimately, experts say, that is the idea behind contextual collaboration.

"What's better with a plug-in component is that applications that are not collaborative can start to understand collaboration," says Robert Ginsburg, CTO of Version 3, a Columbia, S.C., company developing next-generation collaborative technologies.

He says that is important so collaboration can take place between people and between machines.

"You have to extend collaboration to line-of-business applications and then extend it to other communications such as batch communication, process communication where numerous things have to happen before you communicate with a real person. You have to adopt that into the contextual collaboration metaphor," Ginsburg says.

When that level is reached, experts and users say, contextual collaboration will have arrived as a set of network services available to all applications within a corporation and will no longer be something embodied in a separate and stand-alone platform. ■

BMC

continued from page 23

On the mainframe side, BMC will release Version 2.0 of System Performance for DB2, which adds navigation components intended to provide a more "task-oriented" approach to managing system performance, Chen says.

The new reporting capabilities allow a DBA to check on system health, accounting and audit data without having to use DB2's system management facility.

The company also has released Database Performance for DB2 Version 1.1, which adds a tool that lets DBAs reorganize a database without having to take it offline. A similar "online reorg" capability was added to BMC's SmartDBA tools for Oracle's database earlier in the year.

The other upgraded mainframe tools are Application Performance for DB2 Version 2.0, Database Administration for DB2 Version 1.2 and Recovery Management for DB2 Version 1.1.

On the distributed database side, BMC will announce SQL-BackTrack for DB2 UDB Version 2.0, which adds new back-up and recovery capabilities, and SQL-Explorer for DB2 UDB Version 6.0.02. This has been integrated with another tool, DBXray, so that an administrator can locate poorly performing SQL code from within DBXray, which is a diagnostic tool, Chen says.

The mainframe tools are available now, priced from $21,800 for the Application Performance product to $86,300 for the Database Administration tool, BMC says. The DB2 UDB, also available now, is priced at $5,610 for up to 25G bytes of storage for the SQL-BackTrack product, and $3,140 per Windows NT workgroup server for SQL Explorer.

Niccolai is a correspondent with the IDG News Service's San Francisco bureau.

More online!

See what features collaborative software vendors SiteScape and Open Text are adding to their products.

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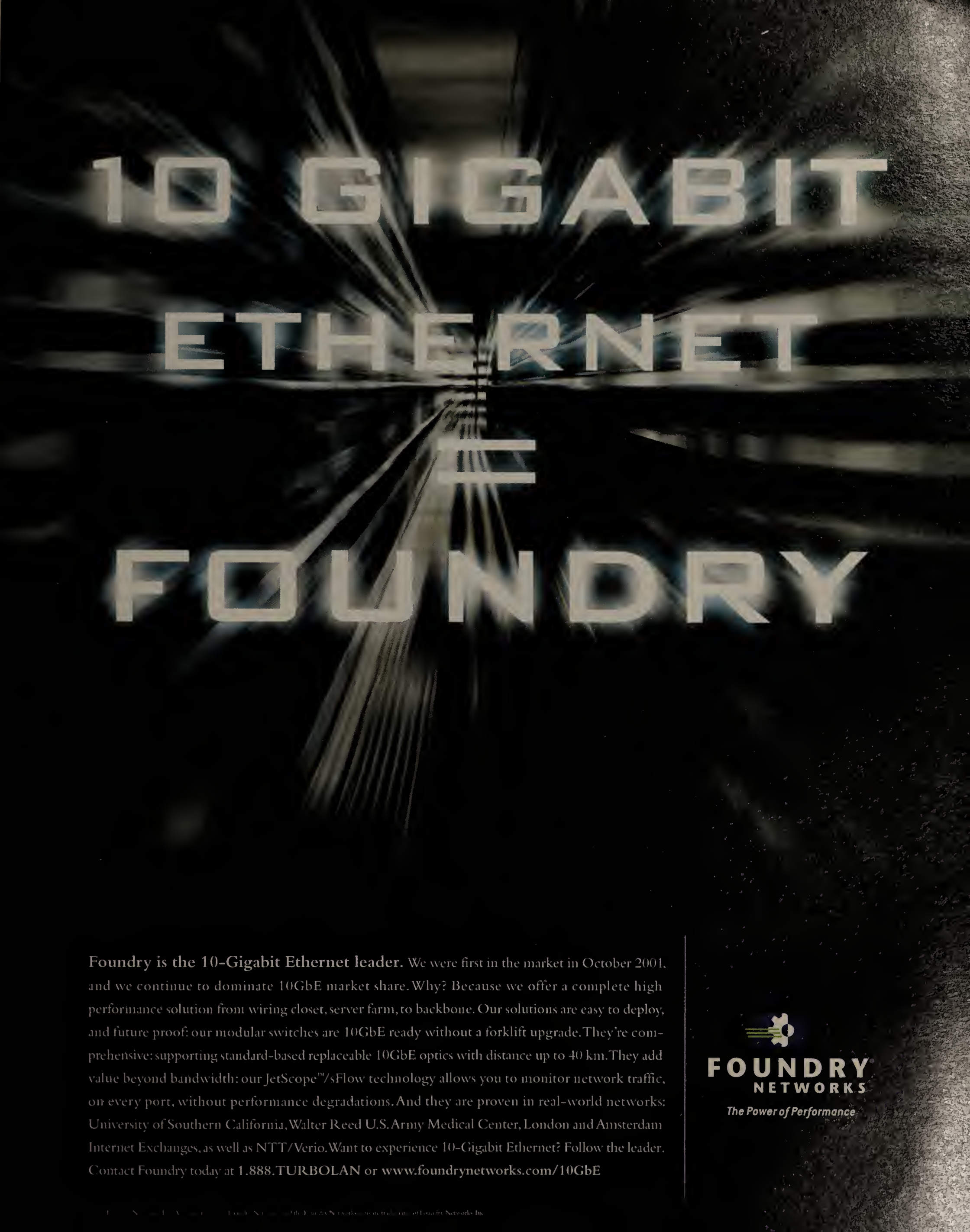

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Q&A

Digex CEO sees calm after WorldCom storm

Managed hosting firm Digex has had its share of troubles, not the least of which is the bankruptcy filing of parent company WorldCom. Over the past six months the company has replaced its CEO, reduced staff and revamped its board. It recently announced it is seeking "strategic alternatives," including a possible sale of the company. Network World *Senior Writer Jennifer Mears recently spoke with Digex CEO George Kerns about where the company is headed.*

You took over as CEO of Digex in June, during a particularly turbulent time. Could you talk about that transition and what your goals were at that time?

I took over four days prior to the [firing of former WorldCom CFO] Scott Sullivan, so it was soon in my tenure that external forces came into play. But irrespective of what was going on at WorldCom, the first thing was that Digex needed to have a business plan that made sense in today's environment. It was clear to me that growth was not going to take place as planned and that we needed to do some calibration to get in line with where our revenue really was. So we put together this revised business plan. We did that in less than a month, presented it to our board members and then to WorldCom. At that time WorldCom was pretty near petitioning for bankruptcy so we made sure we were protected, that the funding that we were dependent on from WorldCom was in place through the bankruptcy petition.

In addition to looking at the financial picture, what kinds of changes have been made in operations and services?

We're focusing on three major solution segments. One is what we call e-enablement, which is basically comprehensive Web hosting. That's where Digex got started in 1996. Our second major segment is commerce. Now we're spending a lot of time in our research and development on a solution segment called Enterprise IT. As more software vendors have written their software to run in this network-based architecture, it avails us of a lot more opportunities. We're taking other slices at the marketplace by looking at verticals. The two verticals we picked out to concentrate on now are pharmaceutical, medical device companies because we have a good share of that market already. We're also looking at consumer product goods, where we have a big market share with the Krafts and the Nestles and the Hersheys and the Mars.

See Digex, page 28

RBOCs gain ground on long-distance

Impact on big business accounts might not be immediate.

■ BY MICHAEL MARTIN

A flurry of activity by the Federal Communications Commission and regional Bell operating companies has pushed the RBOCs significantly closer to offering business customers long-distance services throughout the U.S.

All four RBOCs have made recent progress in their long-distance treks, which began when the Telecommunications Act of 1996 let RBOCs enter long-distance markets in their home states if the RBOCs first opened their networks to competitors.

BellSouth has won FCC approval for the final two of its nine home states, meaning the RBOC can offer long-distance anywhere in the U.S.

Qwest has gained permission to offer long-distance in nine of its 14 local states — the carrier's first long-distance success.

SBC Communications now can offer long-distance in California, its most populous local state.

And Verizon filed an application seeking long-distance approval in West Virginia, Maryland and Washington, D.C. — the only three regions where Verizon can't yet offer long-distance services.

Three RBOCs — Verizon, BellSouth and SBC — have unveiled national long-distance strategies. Qwest already offers long-distance to businesses outside its local service states.

Despite the RBOCs' success in winning regulatory relief, they might not be quick to go after national enterprise accounts, says David Rohde, an analyst at TechCaliber.

"Provided you keep your expectations low as to the result, it's not a bad idea to start distributing [requests for proposal] to the RBOCs, probably in their home territory," Rohde says.

TechCaliber has submitted some long-distance RFPs to the RBOCs, Rohde says, but more often than not the RBOCs have made no bid. The likely reason for the lack of response is that the RBOCs can't fill the more complex needs of some TechCaliber clients, he says.

"They can do outbound [long-distance] and inbound [long-distance], provided there are no complex call center requirements and simple data networking," he says. "What I would strongly recommend is not to bother with the RBOCs at the moment if a network either now or will soon require something like [Multi-protocol Label Switching]."

The RBOCs aren't committing the kind of capital required to build out complex national networks, Rohde says. Instead, they might lease network capacity from third-party providers. When Verizon unveiled its national data strategy in November, the company said it would lease out-of-region networks, rather than build its own.

Leasing, rather than building capacity might save money, but it's unlikely the RBOCs will have a significant effect on telecom pricing, says Thomas Nolle, president of CIMI and a *Network World* columnist.

See Gains, page 28

More online!

Get up to speed on another RBOC battle, this one with states over local phone regulations.

DocFinder: 3735

Short Takes

■ **Cingular Wireless** and **AT&T Wireless** are beefing up wireless coverage through a recently announced spectrum swap. Cingular is picking up licenses in Alabama, Georgia, Kentucky, Mississippi and Texas. AT&T Wireless is picking up licenses in Alabama, Idaho, Oklahoma and Mississippi. AT&T Wireless also is taking over Cingular's operations, including its customers and network, in Kauai, Hawaii. The deal does not involve cash, only the exchange of assets in an effort to expand wireless network coverage.

■ DSL provider **Southwestern Broadband Holdings,** formerly known as IP Communications, revealed last week that its creditors are forcing it into **Chapter 7** bankruptcy. Unlike Chapter 11 bankruptcy, in which companies usually reorganize and emerge to do business again, those filing for Chapter 7 bankruptcy usually are dismantled and sold to pay creditors. Southwestern Broadband serves about 7,000 residential and business customers in Kansas, Missouri, Oklahoma and Texas. Company officials say they will shut down service in Kansas, Missouri and Oklahoma by Feb. 10 and in Texas by Feb. 17. www.ip.net

EYE ON THE CARRIERS

Johna Till Johnson

New Year's resolutions for telecom managers

Let's face it, 2002 was a tough year. Between telecom bankruptcies and budget freezes, telecom managers faced some of the biggest challenges of their careers.

And telecom continues to be a top focus: 85% of IT execs surveyed by Nemertes Research said that telecom best practices is one of the top four priorities for this year. In that spirit, here is a set of New Year's resolutions to get you off on the right foot:

Issue requests for proposal. Yes, it's a hassle collecting all the information about telecom usage and composing the RFP with detailed service-level agreements (SLA). But the exercise is worth the effort. Creating an RFP forces managers to take a close look at telecom and networking historical data, trends and future projections — which provides invaluable insight for strategic decisions downstream.

Approach fledgling and established carriers. I'm not recommending that you bet the company on a provider nobody's ever heard of, but small telephone companies might provide more advanced features, lower cost and superior customer service — at no increased risk. Keep in mind that there's no guarantee that even established telephone companies will continue to be around — and it's a virtual certainty that neither their technology nor customer service is about to improve dramatically until the market opens up. Start-ups might play a useful role as back-up providers or serving noncritical business locations.

Keep negotiating. Never take a service provider's first offer. You might be more interested in service enhancements than price reductions (particularly these days), but regardless of your goals the deal always gets sweeter as time goes on.

Remember the "out" clause. Even if you've negotiated the perfect deal, enforcing it can be another matter. By including an out clause in your contract, you gain leverage. Some clients have included a clause that lets them depart without penalty if the service provider files for bankruptcy. For others, it's consistently missing SLAs that would trigger the clause. Whatever your top issues, ensure that you're free to walk if the carrier's not addressing them.

Make accurate bills the carrier's responsibility. Many large organizations pay one or more people to do nothing more than audit phone bills. Why should you assume that cost? Accurate billing is the service provider's responsibility. Some clients successfully have included the contract clause that "payment is due on receipt of an accurate bill" — forcing service providers to step up to the plate and fix inaccuracies.

Be nice. Service providers are people, too. It's not the account representative's fault that the CEO's a crook or the senior vice president cooked the books. And the technical folks, more likely than not, are just trying to do their jobs (like technical folks in most organizations). That doesn't mean you should put up with shoddy service, but it does mean keeping in mind that the humans providing it are, well, human.

Best wishes for a happy, healthy, prosperous 2003 to all.

Johnson is president and chief research officer at Nemertes Research, a technology research firm. She can be reached at johna@nemertes.com.

Q A

Digex

continued from page 27

What kinds of services are you offering those vertical customers?

Some of this is under development, so I don't want to portray this as it's ready to go. In the consumer product goods, a lot of our customers are extracting information from their Web sites, pumping it into data warehouses and then using business intelligence software to mine the data. I'm saying why shouldn't we be doing that for them? That should be part of our offer, so besides providing all that high availability Web hosting, we can offer people a way to mine their data. When you get into pharmaceuticals, there is a lot of stuff they're subject to from the Food and Drug Administration standpoint and things like that that we're looking at. How do we accommodate those requirements so that we can be a unique entity in the marketplace.

How much effect does WorldCom's bankruptcy have on Digex? Do you find customers are concerned?

We had a funding relationship with WorldCom. However, part of this new business plan was to become financially independent, meaning we won't require funding from anybody, WorldCom or anybody else.... There is still somewhat of a reluctance to do business with WorldCom until everybody knows that they're healthy.

Describe Digex's recent decision to seek strategic alternatives.

One thing I had to do was rebuild the board of directors. Once we got a new board in place, I gave a report on the state of the union here and some of the issues we're dealing with, and the board felt it was appropriate to establish a special committee to look into alternatives. The special committee is made up of the independent board members and they engaged an investment banking firm, Lane, Berry & Co. International, to help them look at these alternatives.

What are your thoughts of what could ultimately happen? In today's economy people hear strategic alternatives and they think bankruptcy.

You're right. But we didn't get a pink slip from WorldCom. It's not, 'Gee, those guys must be in dire straits. They got a pink slip from WorldCom. Now their back is against the wall and they've got to do something quick.' This is something that's been thought through. We've got the right people working on the right process and a good outcome will come for all the stakeholders of Digex.

Do you expect more reductions?

No. When we sized this thing we sized it to our revenue stream. Unless our revenue took a very significant dip, we wouldn't need to make a correction. Now we're focused on maintaining our customer base, taking advantage of the opportunities in the marketplace to grow and acquire new customers. We spent a lot of time developing relationships with systems integration firms. They compete with IBM for outsourcing and EDS. Combining the Digex skill set with the skill sets of the large systems integration houses creates a pretty compelling alternative to an IBM or an EDS.

Are IBM and EDS your primary competitors?

IBM, EDS, AT&T. But really the major competitor is not them, it's in-house, people who are still hanging on to their processing in-house and haven't fully embraced an outsourcing model. That's why it's incumbent upon us to make sure we can demonstrate that we can do things for less and we can do them better.

What services can enterprise customers expect from Digex going forward?

We're looking at ways that we can start penetrating some of these companies still committed to keeping things in-house without forcing them to make a full commitment to outsourcing. So it becomes more of a phased way of doing it. ■

Gains

continued from page 27

"All of the carriers are financially stressed at the current price levels," he says.

Also, Nolle notes, the RBOCs haven't tried to compete on price in states where they have launched consumer long-distance voice services. Instead, he expects the RBOCs to flaunt their financial stability.

BellSouth uses a combination of pricing, stability and service to attract businesses to its long-distance services, says Rex Adams of BellSouth Long Distance.

"Our value proposition is we save them money through strong pricing as well as service and taking responsibilities off their hands," he says.

Adams says BellSouth has several long-distance business customers, most of which are in the commercial banking industry.

BellSouth's offerings are ideal for companies that are clustered around a metropolitan area in BellSouth territory, Adams says. A company with one location in Miami (in BellSouth territory), another in New York, another in Frankfurt and another in Tokyo likely would be better off going with a traditional long-distance provider, he adds.

Nolle says the RBOCs will expand their long-distance footprints gradually. They'll start by offering intrastate services, then offer services in neighboring states before expanding to national coverage, he says. Nolle doesn't expect the RBOCs to be truly national players until the second half of this year.

However, once they enter the national market, he says they will provide serious competition to interexchange carriers (IXC) such as AT&T, Sprint and WorldCom.

The RBOCs certainly have had success in taking market share from the IXCs in the consumer long-distance market. Verizon has gained almost 10 million long-distance customers since it won approval in its first state — New York— in 1999 and has nearly a 30% long-distance market share in New York and Massachusetts.

Now that the RBOCs are close to gaining approval to offer long-distance throughout the U.S., it's also possible that there might be some RBOC/IXC mergers, Nolle says. With WorldCom's well-documented problems, regulatory bodies will be less likely to block potential mergers on anticompetitive grounds, he says. ■

Long-distance lags

Verizon, SBC Communications and Qwest still lack FCC approval in some of their home territories.

Verizon:
Approved: 11 states
Missing: Maryland; Washington, D.C.; West Virginia.

SBC:
Approved: Seven states
Missing: Illinois, Indiana, Michigan, Nevada, Ohio, Wisconsin.

Qwest:
Approved: Nine states
Missing: Arizona, Minnesota, New Mexico, Oregon, South Dakota.

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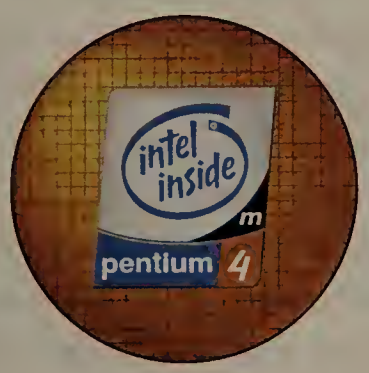

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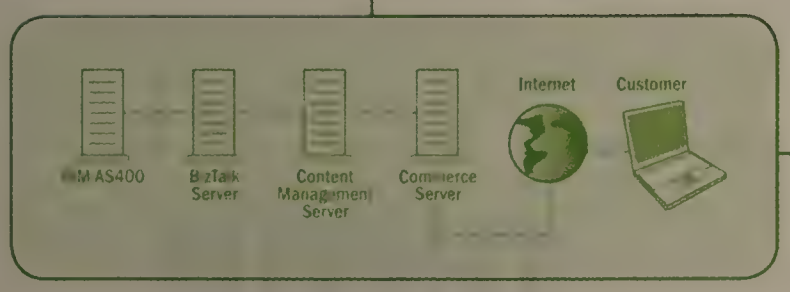
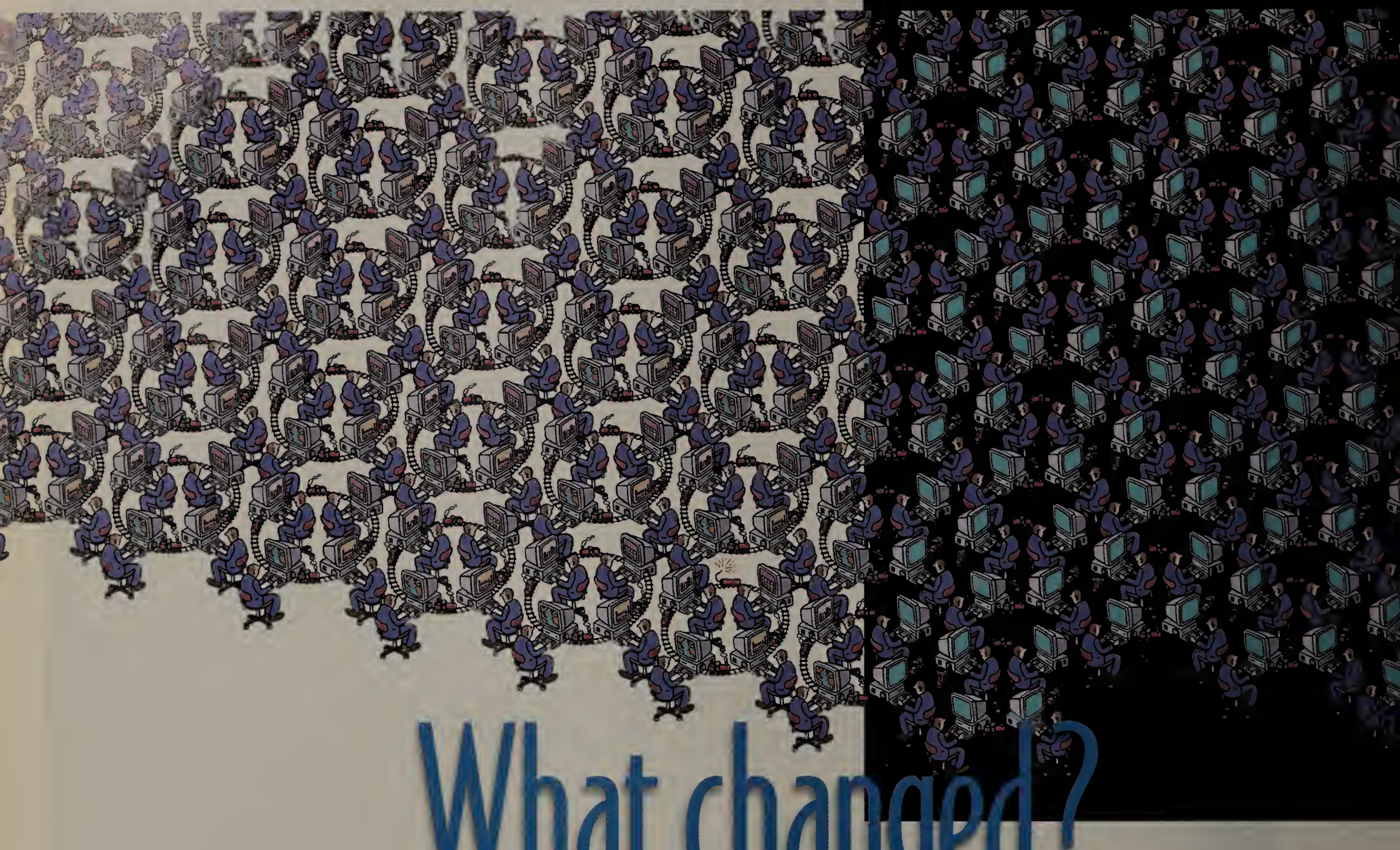


Microsoft



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■ PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

Telework used to improve air quality

The city of Austin selects GoToMyPC Web service to help expand program.

■ BY TONI KISTNER

AUSTIN, TEXAS — Since 1996, Austin's city government has looked to telework as a means to improve air quality by decreasing vehicular emissions. But budget and technology constraints kept its program from taking flight. Because Austin lacked the funds to provide laptops or workstations for the employees' home offices, IT struggled with how to fashion teleworkers' home PCs into stable and secure remote workstations.

"For years we've made some attempts, tried different approaches, the same story as everyone else," says Brownlee Bowmer, CIO of Austin's Information Services Department (ISD).

But last year, Austin's telework initiative got a double shot in the arm. The city received an $86,000 grant from the state energy conservation office to develop its telework program. Bowmer's security team now could test a number of newer remote-access technologies and develop an intranet site promoting telework, and the city could hire a telework program manager, Wendy Frizzell, to market the program and provide telework training.

In the end, Bowmer's network security team selected Expertcity's GoToMyPC as its primary method for connecting remote workers to the office. Today, 300 Austin teleworkers in a variety of agencies use it to access their corporate desktops via their home PCs, while another hundred or so use traditional VPN, dial-up or Citrix Metaframe to connect to the city's network. Austin's goal is to have 1,000 teleworkers by mid-2005, most using GoToMyPC.

Most Austin teleworkers work from home one day per week. Many use telework to avoid coming in on the weekends, and a small number telework several days or even full time from home. Many work in ISD, the city clerk's office, city manager's office and emergency medical services department.

Although improving air quality is the program's prime driver, Frizzell finds telework benefits city workers with special needs. "We've had very good success with people on maternity leave who extend their time at home by teleworking 20 hours per week before returning to the office. We also use it for a handful of workers who are ill with cancer and receiving chemotherapy," she says.

Long arm to the office

GoToMyPC is a Web-based remote-access service that lets users access their corporate desktops from any browser-based PC. An always-on client program is installed on the corporate PC, which then stays in constant communication with the GoToMyPC server on Expertcity's network. When a teleworker wants to access his corporate desktop, he connects to the service via a browser and must clear two levels of password authentication before the target desktop appears as a window on-screen.

While many network executives find the idea of having a slew of corporate desktops in constant communication with a third-party service unacceptable, Expertcity is finding success in public sector IT departments such as Austin's, which is pushed to comply with regulations like the Clean Air Act, but can't afford new equipment for teleworkers. The company also recently announced deals with the state of Alaska; King County, Wash.; Albany and Rochester, N.Y.; and San Bernadino, Calif.

"We have a very robust security organization that did thorough testing of the product," Bowmer says. "We rolled it out slowly and didn't suffer any intrusions. Anything Internet-based is always a red flag for any IT organization, but GoToMyPC has significant security around it."

Easing Austin's aches

Another key to the success of Austin's telework program is keeping support costs low. Many of the VPN products Bowmer's network security team tested met their security needs. "But VPN support costs were crippling us," says Teri Pennington, ISD's information security supervisor.

"The VPN itself wasn't difficult, but users weren't clear on how their PC actually works on the network," Pennington says. "We'd get numerous calls from users saying they were having trouble mapping drives, or accessing network files or e-mail. They always assumed it was a VPN problem when it usually turned out to be a problem with the user's PC configuration."

With GoToMyPC, IT doesn't support the home PCs. "If a user has a problem while teleworking, it is probably with their office PC and we've already got that covered," Pennington says.

Another way GoToMyPC saves in support costs: If the teleworker needs to run some sort of processor-intensive program, his home PC might not have enough power to support it. Because GoToMyPC uses the home PC to access all the applications on the work PC, the home PC doesn't need to have the same applications loaded.

"Very seldom does the help desk get a call," Frizzell says. "I usually get the first call because my name's on everything. And I can often help them myself, and I'm not technical." ■

TELEWORK PROFILE: CITY OF AUSTIN

Employees:	12,000 workers, about 4,800 eligible to telework
Teleworkers:	About 400 with plans to reach 1,000 by mid-2005
Goal:	To improve air quality by decreasing vehicular emissions
Challenge:	Expanding the program on a limited budget without compromising security
Remote-access technology:	A mix of VPN, Citrix Metaframe and Expertcity GoToMyPC
Policy snapshot:	City doesn't pay for equipment or services. Individual departments develop telework policies, and participation is voluntary both for managers and employees. Teleworkers required to run antivirus and personal firewall on home PCs, and attend a training session focusing on remote work practices, security and ergonomics.

Short Takes

■ Driven by strong growth in the small office/home office and retail market, Wi-Fi chipset shipments far outpaced analyst predictions in 2002, according to an **Allied Business Intelligence** report. Chipset shipments will reach 23 million to 25 million units, up from 7.9 million in 2001, exceeding the 14 million to 15 million predicted for 2002. The report, "Wi-Fi Integrated Circuits: Industry Dynamics, Market Segmentation and Vendor Analysis for 802.11a/b/g" predicts by the end of 2003, 802.11g will compose 18% of chipset shipments, and by 2004, revenue from dual-band chipsets will exceed those for 802.11g and 802.11b. **www.alliedworld.com**

■ **Netgear** recently announced a dual-band wireless access point. The WAB102 supports 11M bit/sec 802.11b and 54M bit/sec 802.11a client devices, so that small businesses can set up a fast 802.11a network in the office that's accessible by teleworkers using slower 802.11b at home or in hotspots, for instance. Because the upcoming 802.11g standard is backward-compatible with 802.11b, the access point will work with future 802.11g devices. Netgear provides a three-year warranty and 24-7 technical support. The access point costs $300. **www.netgear.com**

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Federal telework: Read about government efforts to develop telework programs.

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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

Achieving true 10 Gig performance

■ BY MARSHALL EISENBERG

From its inception, 10G Ethernet was intended to retain backward compatibility and full interoperability with 10/100/1000M bit/sec Ethernet while adding a tenfold increase in performance.

In the 802.3ae standard, attaining tenfold performance is not as simple as it might appear. A critical difference between the 10/100/1000M bit/sec and 10G Ethernet media access control (MAC) layer affects the 10G Ethernet interface's ability to deliver 10G bit/sec of line-rate performance. The authors of the 802.3ae standard detailed three options to address this issue.

Inside the 10G Ethernet MAC — a critical difference

In 10/100 and Gigabit Ethernet, the MAC layer works in a linear manner — data moves serially in and out of the MAC layer with all the starting and ending control messages (including clocking and synchronization) embedded inside the datastream. With 10G Ethernet, it is much more complex.

To attain a 10G bit/sec bandwidth rate, the IEEE altered the way that MAC layer interprets signaling. Rather than producing a serial stream, the 10G Ethernet layer operates in parallel to interpret data. The transmit and receive paths each comprise four data lanes, and the datastream broken down into bytes is handled in round-robin fashion across the four lanes, numbered 0 to 3. On the transmit path, for example, the first byte aligns to Lane 0, the second byte to Lane 1, the third byte to Lane 2, the fourth byte to Lane 3, the fifth byte back to Lane 0, and so on.

Ethernet frames have clearly defined beginning and ending boundaries, or delimiters. These are marked by special characters and a 12-byte interpacket gap (IPG) that dictates the minimum amount of space or idle time between packets.

Because of the parallel nature of the 10G Ethernet MAC layer, it is impossible to predict the lane in which the ending byte of the previous datastream will fall. This makes finding the starting bit — a requirement for maintaining timing and synchronization — more difficult. The 802.3ae standard mandated an elegant solution: the "start control character," or very first byte of a new data frame, must always align on Lane 0. However, this solution complicates the way the MAC handles the IPG, directly affecting performance. Nevertheless, the IEEE provided three options for the vendors to address this issue: 1) pad (increase), 2) shrink, or 3) average the "minimum" IPG.

Padding increases the IPG

If the ending character of the previous packet falls into 12th slot in the 12-byte IPG, the MAC layer does nothing and maintains the 12-byte minimum IPG, and the starting character of the next packet automatically aligns in Position A of Lane 0. If, however, the ending character of the previous packet falls into other positions, the MAC layer must add bytes respectively into the IPG to ensure that the starting character of the next packet aligns properly in Position A of Lane 0. This results in a minimum IPG that ranges from 12 to 15 bytes (12-byte minimum plus additional pad).

Increasing the size of the IPG beyond the 12-byte minimum decreases the available bandwidth on the 10G Ethernet link by as much as 10%, depending on packet size.

Shrinking the IPG

After padding bytes to the IPG to ensure the starting character aligns to Position A, the MAC eliminates the middle column of idle characters. This results in an IPG that ranges from eight to 11 bytes (12-byte minimum plus padding minus the four idle bytes).

Decreasing the 10G Ethernet IPG by eliminating the middle column of idle bytes provides an additional 5% available bandwidth on the 10G Ethernet link, depending on packet size.

Averaging the IPG

This option uses a combination of options 1 and 3 with the addition of a deficit idle counter, which keeps track of the number of added or deleted idle bytes (ranging from 0 to 3). In some cases, the MAC layer will add and, in others, eliminate bytes. Over the long run, the net result will be an average 12-byte minimum 10G Ethernet IPG.

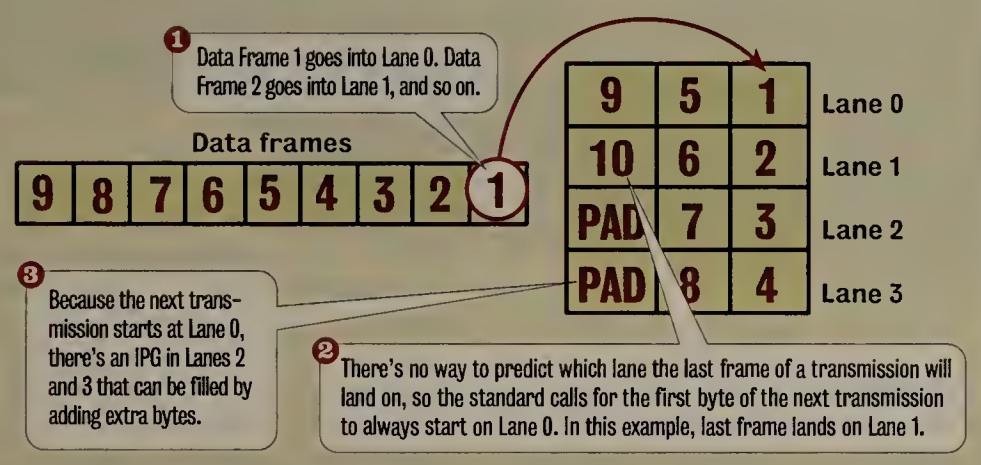
Averaging the 10G Ethernet IPG ensures that the port delivers 100% of the available bandwidth and lets the connection maintain zero-loss line-rate performance.

Eisenberg is director of technical marketing at Force10 Networks. He can be reached at marshall@force10networks.com.

■ HOW IT WORKS

10G Ethernet

The 10G Ethernet standard calls for traffic to be channeled into four lanes in a round-robin fashion.



Got great ideas

■ *Network World* is looking for great ideas for future Tech Updates. If you want to contribute a primer on a specific technology, standard or protocol, contact Amy Schurr, senior managing editor, features (aschurr@nww.com).

Ask Dr. Internet

By Steve Blass

We live in an apartment complex and have Internet access through our school's network. People in the school's dormitories can set up FTP sites because they have fixed IP addresses. We only get internal IP addresses, so we can't send anything out or set up an FTP site. Can we change the settings on our computers so we can do this?

You cannot control the behavior of the apartment complex Internet connection by changing your computer's settings. It probably is not possible to establish an Internet-accessible FTP site in your apartment. You might be able to use a peer-to-peer file-sharing tool or GoToMyPC. The difference is in how connections are established. FTP requires inbound connections across the Internet all the way to your computer. Many peer-to-peer products use outbound connections from the multiple peer computers to one or more central file-sharing service gateways that are visible on the Internet. Keep in mind, however, that the apartment complex's router/firewall might be able to block known file-sharing, file transfer and peer-to-peer networking port numbers. If so, you still might not be able to publish files to the Internet from your apartment.

Blass is a network architect. He can be reached at dr.internet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE

Mark Gibbs

Where the script runs

With Christmas fading to nothing more than a pleasant memory (except around the waistline where the consequences of unbridled gustatory abandon has left its seasonal evidence) we need to get fit again by leaping into an Active Server Page technology workout.

So let's get fancy. Suppose we want to let the user choose the size of an array of radio buttons on a Web page and we want each button to be linked to client-side JavaScript. This means that we'll need to create the array on the fly and generate a handler for each button in the array. Here's a Web page that we'll use to specify the size of the array:

```
<HTML>
<HEAD><TITLE>Array Creator</TITLE></HEAD>
<BODY>
<form method="POST" action="array2.asp">
<p>Rows: <input type="text" name="Rows" size="20" value="1"></p>
<p>Columns: <input type="text" name="Cols" size="20" value="1"></p>
<p><input type="submit" value="Submit"></p>
</form>
</BODY>
</HTML>
```

Load this page and fill in the form entering, say, seven in the Rows field and six in the Columns field, and hit submit. This will create an HTTP request that will request array2.asp. This page looks like (for brevity we've only shown the code in the body and included line numbers for reference):

```
1 <%
2 MaxRows = Request.Form("rows")
3 MaxCols = Request.Form("cols")
4 For intR = 1 to MaxRows
5 For intC = 1 to MaxCols
6 %>
7 <INPUT TYPE = radio VALUE =Button <%=intC%><%=intR%>
8 OnClick = "Button<%=intC%><%=intR%>_Click()">
9 <% Next %>
10 <p>
11 <% Next %>
12 <SCRIPT LANGUAGE ="VBScript">
13 <%
14 For intR = 1 to MaxRows
15 For intC = 1 to MaxCols
16 %>
17 Sub Button<%=intC%><%=intR%>_Click()
18 MsgBox "That is column <%=intC%>, row <%=intR%>."
19 End Sub
20 <%
21 Next
22 Next
23 %>
24 </SCRIPT>
```

Here's where we meet a major architectural feature of ASP: The IIS Object Model. The model is based on six core objects: Application, ObjectContext, Request, Response, Session and Server. Each one of these objects has its own events, properties, methods and collections (objects that contain a set of related objects).

In the ASP page above, lines 2 and 3 use the Request object to retrieve the arguments submitted by the form in the first Web page using the HTTP POST method. The Request object gives you access to the HTTP header and body and the "Form" object is the collection of all the POST items. Note that "Request.Form" is an abbreviated version of "Request.Form.Item" — the "Item" property is used to get a specific element in the collection by name. This means that we could have written lines 2 and 3 more properly as:

```
2MaxRows = Request.Form.Item("Rows")
3 MaxCols = Request.Form.Item("Cols")
```

This code retrieves the arguments by their explicit names, that is "Rows" and "Cols," respectively.

If we didn't know the names but knew that the order of the arguments, then we could use the following code to retrieve the correct values:

```
2 MaxRows = Request.Form. (Request.Form.Key(1))
3 MaxCols = Request.Form. (Request.Form.Key(2))
```

The "Key" property is used to get items by number. If we had had a variable number of arguments to handle then we could get a count of how many arguments are in the Request object using:

```
NumArgs = Request.Form.Count
```

The array2.asp Web page consists of sections of scripting and other sections HTML content. The scripts are framed by "<% ... %>". But we also have scripting inside the tags "<SCRIPT> ... </SCRIPT>". Our generated VBScript (to be executed on the browser) will be inside these tags.

Get these files from www.gibbs.com/021223; put the ASP page in a server subdirectory where it can be executed (put the form that requests the page in the same directory for the sake of simplicity). Send your variables to gearhead@gibbs.com.

Cool Tools

Quick takes on high-tech toys

By Keith Shaw

Testing the Logitech IO pen

I'm generally an optimist about new technology. When a new tool comes along I start with the assumption that it might improve our lives. But that predisposition makes it more painful if the device doesn't live up to expectations. That's what happened when I tried Logitech's new IO Personal Digital Pen.

The pen, which launched at last year's Demo Mobile conference, is designed to convert a user's handwriting to digital output. For example, by placing the pen in a cradle connected to a PC, digital content can be moved into an e-mail message or into Outlook as a calendar appointment or a "to do" item. This enchanted me — finally I could just handwrite my appointments into a notebook (or paper) calendar and this information would be transferred electronically into my Outlook calendar. No more extra typing!

The pen works with special paper that helps the pen record information. In one notebook I used the top part of each page is reserved for regular notes. Anything written here is converted to a JPEG "art" file when it transfers to the PC. The bottom part of the page is used to convert handwriting into digital text. You can write each letter of an e-mail address, for example, into a box. The pen records the strokes and converts each letter into its digital equivalent. When you synchronize the pen, that part is converted to text and shows up in the "To:" field of the e-mail message.

This text-conversion process is where the pen disappoints. Despite repeated attempts to train the pen to learn my handwriting, the conversion process was not very accurate. In one case, the words "WRITE REVIEW OF IO PEN" turned into "WRITE R?IL=WO F10 PEN." And I have above-average penmanship. Each notebook gives you two chances to "train" the pen — the training consists of writing uppercase letters into little boxes.

Perhaps with additional training, the pen's accuracy would improve, but there were no extra areas to do this, unless I rewrote the letters in the notebook's training area, which I felt would only decrease the accuracy. (Try writing with a pen over letters you've already written; it becomes an exercise in tracing.)

The part of the notebook where the pen recorded my writing and drawing and converted it to a digital image worked wonderfully. Write or draw anything and it converts it to a JPEG image that can be attached to an e-mail or placed into a Word file. A full page of notes became a 119K-byte file attachment. Users who want to send along handwritten notes or even drawings (such as charts and schematics) definitely would benefit from a pen like this.

The pen also comes with specialized Post-It Notes paper, which records your notes and then transfers them to a digital Post-It Note that opens on your desktop. The writing on the Post-It Note also appears as a digital image that you can attach to an e-mail or import into Outlook.

The text-to-image portion of the pen works well — but until the text-conversion process improves (whether that means extra training or better recognition technology), I can't recommend this as a Cool Tool just yet. So until then I'm still writing my appointments by hand and typing them into Outlook.

Shaw is the senior reviews editor at Network World. He can be reached at kshaw@nww.com.

Logitech's new IO Personal Digital Pen doesn't live up to expectations.

IO Personal Digital Pen

Company:	Logitech, www.logitech.com
Cost:	$200
Pros:	Great for capturing drawings and handwritten notes that can be transferred to the PC for attaching to e-mail.
Cons:	Handwriting-to-digital text conversion needs improvement.

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EDITORIAL

Network World
Editorial Management

Revisiting last year's predictions

We made 13 predictions at this time last year so it's time to see how we did. Next week we'll set our sights on 2003.

• **Hewlett-Packard and Compaq merge but the new company is plagued by integration headaches.** Half-right. The contested merger went through but integration isn't as problematic as predicted. User confidence is high.

• **All the regional Bell operating companies will be in the long-distance market by year-end in more than half the states.** Right. There are only 14 states where the RBOCs still need 271 approval.

• **The Microsoft suit fades away and the states give up.** Bingo. Although Massachusetts and West Virginia refuse to face reality and are pressing on.

• **Point products replace network management platforms.** Sort of. Frameworks are dead, but point products are not king. Software suites that can be integrated easily are the rage.

• **Lucent or Nortel will be acquired.** Wrong, but the companies continue to post monumental losses: $11.8 billion for Lucent for the 2002 and $3.3 billion for Nortel for the nine months ending Sept. 30.

• **Despite increased acceptance of Linux, more open source-specific vendors close shop.** Right enough. Some Linux vendors consolidated their efforts by coming out with UnitedLinux, while others refocused.

• **Companies are slow to adopt 802.11a 54M bit/sec wireless Ethernet products because handheld devices don't support it and because of the looming 802.11g standard promises backward compatibility with 802.11b. But introduction of dual 802.11a/b access points might lead to some uptake.** Right. 802.11b is still king, although the 802.11a/b combo products arrived too late in the year to drive much change.

• **Bluetooth in cell phones and PDAs will drive adoption in other devices.** Not at the rate we anticipated.

• **ISCSI bounds forward, raising questions about the need for Fibre Channel in storage networks.** ISCSI gains ground, but the emergence of 2G bit/sec Fibre Channel ends talk of Ethernet gaining share in storage networks.

• **Web services technologies gel, and by year-end companies are using them to build corporate applications.** That's true. However, implementation issues still make it a headache to integrate software from different vendors.

• **Employees seeking telework spikes upward.** The economy chokes off these efforts, but the telework force still grows slowly.

• **Supplier resource management gains big attention.** It did indeed. Big outfits such as Wal-Mart now require all suppliers to play along.

• **The economy bounces back in the third quarter.** Rats.

— *Network World* editorial management

opinions!

Filtering through

Thanks to Joel Snyder for his column "IPS: A technology, not a product" (www.nwfusion.com, DocFinder: 3723). The discussion of intrusion-prevention systems as a product category was driving me out of my mind.

Snyder is right that customers definitely have a host of security challenges that remain unaddressed. But I don't know any customers who are dying to get another filtering platform. Between routers, switches, firewalls and intrusion-detection systems, they have too many already.

Detection mechanisms that are appropriate for within corporations, the perimeter and even for service provider networks are in need. But these will almost certainly leverage existing filtering platforms.

Ted Julian
Co-founder and chief strategist
Arbor Networks
Lexington, Mass.

GigE to the desktop?

After reading your editorial "Are you ready for GigE to the desktop?" (www.nwfusion.com, DocFinder: 3721) I can only respond by saying I dreamed of the day when GigE would become affordable enough for my small LAN of 15 PCs to make the jump. I am not your typical IT manager; I needed GigE to desktop — not just for its speed, but (hopefully) for the reliability and compatibility.

In 1996, when my company had a different IT manager and ATM was supposed to be the next best thing, we moved to a new building. We took a gamble and installed OC-3 fiber instead of copper for our network. That's right, we spent well over $100,000 to put in ATM over OC-3 fiber to the desktop.

Since then, we have had reliability, vendor and compatibility problems. And once we made that kind of investment for a small office, we lived with it and had to work around the problems.

Just last month, I have started making the move to GigE. I figure with the current fiber installed, and shopping around using Pricewatch.com and eBay for purchasing my network interface cards and switches, I can move all 15 PCs to GigE for less than $10,000.

On the tests I have run using products from NetIQ, I have jumped my throughput from a typical 50M bit/sec to 70M bit/sec using ATM to 275M bit/sec to 300M bit/sec using Gigabit Ethernet. My boss is happy, I'm happy and I have some used ATM equipment for sale if you know anyone who's interested.

Ken Henderson
IT manager
Law Offices of William R. Ramsey
Valencia, Calif.

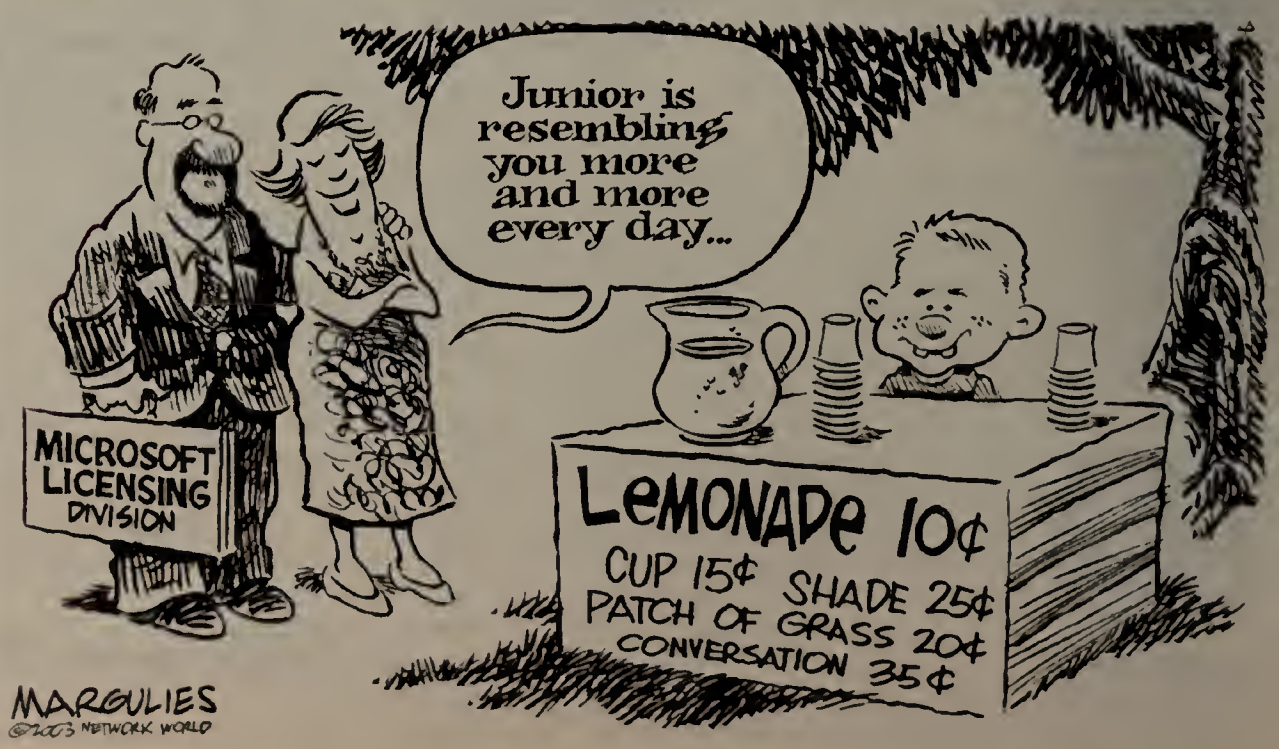
A familiar problem

When I read the title of Frank Dzubeck's column "DSL buyer frustrations continue" (DocFinder: 3724), I expected a different discussion than the content that followed. Dzubeck's experience is common to all circuit issues that require local exchange carrier engagement, not just DSL. In other words, the DSL market is being introduced to an existing painful and time-consuming issue. I agree with Dzubeck's opinion of the problem, and while the Federal Communications Commission could draft a mandate, a few suggestions about the process would have made for a positive end to his column.

Shawn Reed
Fayetteville, Ark.

E-mail letters to jdix@nww.com or send them to John Dix, Editor In Chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! www.nwfusion.com Find out what readers are saying about these and other topics. **DocFinder: 3726**



USER VIEW

Chuck Yoke

New network acronyms for 2003

By aligning technology research with a company's financial goals, architects can avoid wasting time . . .

As another year dawns and the economy shows no signs of a rapid recovery, savvy technology architects need to add a few more acronyms to their lexicon: TCO, ROI, EBITDA, NPV and IRR.

These acronyms were previously the linguistic realm of the corporate finance department. But the current business economy is dictating that they become familiar to anyone whose work can affect the financial state of a company. And technology investments — especially investments in network technology — can have a definite financial impact.

Anyone involved with planning, obtaining or implementing corporate technologies in the coming year needs to ensure that the proposed solutions are based on sound business principles. As I have said before, technology architects need to focus more on profit and loss than bells and whistles. Technology solutions have to meet business and functional requirements, but they need to be fiscally responsible. Gigabit Ethernet to the desktop might be a cool technology to recommend for new branch offices, but unless your users are pushing 100M bit/sec on a regular basis, Fast Ethernet will probably get the job done more economically. And while the technical staff might want to use internal resources to design, implement and manage a corporatewide, multimedia network infrastructure, fiscal research might reveal that it is more cost-effective to use a vendor-provided managed service.

Each company has its own method of evaluating financial decisions. Some use a basic, total cost of ownership (TCO) model, in which you map out the overall cost in hardware, depreciation, maintenance, support and manpower that a technology would incur over a certain time (normally three or five years). Some use a simplistic overall-cost model, while others also might want a return on investment (ROI) analysis to see potential cost avoidance, cost savings or revenue increases.

Other companies might require a more rigorous analysis. If a company is focused on earnings, management may want to see how an investment will affect earnings before interest, taxes, depreciation and amortization (EBITDA). This might involve more complex net present value (NPV) and internal rate of return (IRR) calculations that require a cash-flow analysis over a certain time period.

In many cases, architects will need to partner with the finance department to understand these models and obtain help with their analysis. Often the finance department will have spreadsheet templates that automatically perform the necessary calculations.

However, even if this assistance is readily available, technology architects still need to understand the models their companies use, as well as key financial concepts. By aligning technology research with a company's financial goals, architects can avoid wasting time researching technologies that are too costly and focus on solutions that will bring overall value to the company.

Yoke is a business solutions engineer for a corporate network in Denver. He can be reached at ckyoke@yahoo.com.

ON SECURITY

Winn Schwartau

What's happened to availability?

The best-run security organizations create a horizontal team of experts from many disciplines . . .

Whatever happened to the A in CIA? That's what a reader asked recently, referring to the tried-and-true information security triad: Confidentiality (keeping secrets secret), Integrity (ensuring information is not modified) and Availability (keeping electronic doors open and IT shops humming).

Availability has become perhaps the most pressing post-9/11 security issue for network-centric firms. Today, responsibility for network availability is being moved from information security staff to others within the corporate organization. Some firms view availability as part of disaster avoidance. For example, how do you pick a location for a back-up data center? What possibilities must be considered? Acts of God, to be sure. But now, acts of man are in the forefront of our paranoia. Package bombs? Severed transportation or communications links? Shoulder-launched missiles fired from buildings or hilltops? Is availability the responsibility of information security professionals, counterterrorism experts or disaster-recovery teams?

Other companies consider availability a part of business continuity. Some cities now provide utility company specialists to coordinate with local companies and critical infrastructures to ensconce mission-critical power and communications lines in concrete tubes under the streets and ostensibly away from danger. Facilities-management staff often take the lead here, even though the pre-eminent aim is to provide real-time backup, redundancy or fail-safe data centers.

What I see in too many organizations is turf building, budget grabbing and "stovepiping" — vertical building of a hierarchy within a company that has no contact with other divisions or departments. This is the antithesis of what is needed to meet modern, coordinated threats that transcend corporate-divined organizational boundaries.

A new security triad, CPP, redefines the three main areas of security: Cyber (computer, network and information security), Physical (the wires, silicon, glass and structures) and People (employees, consultants, suppliers, partners and anyone in contact with your company). Under this triad, stovepiping of responsibilities and functions creates unnecessary overlap, wasted resources and a mediocre security posture.

Availability should be dealt with in all three legs of the triad. Physical security is valuable and should be part of any serious security efforts, but it cannot be done in a vacuum. Availability is affected by people — internal folks who, with malice or by ignorance, cause network availability to fail. And for organizations thinking about putting availability exclusively into the hands of physical security or business continuity staffs, think again. Denial of service is more than bombs and floods; It also is network clogging, misbalanced traffic loads, too many MP3 or MPG downloads and viruses and worms, to name a few.

All legs of the security triad are important. That's why stovepiping worries me, and the tales I hear are disturbing.

The best-run security organizations create a horizontal team of experts from many disciplines with a common goal: protect corporate physical and information assets from all forms of weakness and threat. They balance risk, reward and threat against budgets, public confidence, possible government oversight, real losses and other factors. The physical guys run the physical aspects of security; network guys talk to them and coordinate (not duplicate) their efforts; and human resources, security awareness and corporate computer emergency response teams mitigate the effects of insiders who can cause just as much damage as a dedicated adversary.

But these teams must have a true leader — evangelist, if you will — empowered with authority to take the necessary steps to implement a coordinated security effort. Top management needs to recognize that while security is made up of many discrete, often technical, pieces, ultimately strong security is created by strong management that understands the need for operational flexibility in the myriad environments that challenge us today. Take a look at the many pieces of your corporate security efforts, from different angles, and see if you and they are working in harmony or in dissonance doomed to disaster.

Schwartau is president of Interpact, a security awareness consulting firm, and author of several books, including Pearl Harbor Dot Com. *He can be reached at winns@gte.net.*

Face-off

Is it ever worth it to cut corners on security?

Two industry insiders debate the need to balance security concerns and business goals.

PHOTOS: GARY LAUFMAN

YES, by Burton Craig

If you design your network to conform with a total-security model, you'll run into at least two major problems: the human factor and what I call "code overload." Acknowledging these problems sometimes involves not subscribing to the total-security model — which some might view as cutting corners.

First, it's tough to implement total security when humans are involved. All levels of the network management cycle are run by people who, even if they are experts, can make mistakes — especially when the network is complex and includes several remote sites. Whether because of a network engineer misconfiguring network equipment or a user opening an infected attachment, your network is exposed. You can take measures to minimize human fallibility, but implementing them usually require an unrealistic amount of time, people and money.

Second, total security can create code overload — and the more code you deploy on your equipment, the more your network performance is affected. Additional code also increases the time it takes to update your rules, which in itself represents a real security threat. Each time you update a system, you open some ports to let the updates go through, which makes it more vulnerable. Too much security can kill security.

While I believe there are times we can't do everything by the book, there are ways to minimize corner cutting.

Instead of trying to accommodate the requirements of total security, serve your business goals first. Because you cannot guarantee foolproof security everywhere, you're better off implementing it where it truly matters to your business. All parts of your network are not equal; some require more surveillance than others. You can optimize the network architecture by segmenting it into different security zones.

There are tools to minimize the problems of human error and code overload. These include vulnerability-assessment, monitoring and policy-management tools. My company uses network security management software from Solsoft because of its multiproduct management capabilities. Other companies might prefer a single-vendor product for VPN and firewall management, such as those from NetScreen or Check Point. Such tools are essential to minimize corner cutting, and without them I wouldn't be able to do my job effectively.

Finally, on the user level, hold regular security audits and policy meetings with employees. Audits tell us where it makes sense to add new security applications, and then let us test them to ensure they maintain a sufficient level of network security. Policy meetings ensure that everyone always is on the same page and up to date on the latest policies.

No one wants to jeopardize the company's security. The hard part is deciding when it's OK to cut corners: that's what's called risk assessment. And it's probably the most interesting part of a network manager's job today.

Craig is director of a midsized IS shop for a large financial institution. He can be reached at burtoncraig@yahoo.com.

NO, by Rob Tillman

From the corporate perspective, there is never a reason to skimp on network security. If you are connected to the Internet, your business is liable for the actions of your network devices. If your network is penetrated, the legal and economic repercussions could be severe. If "no" is the answer I'm told when I ask if there's room in the budget for security equipment and software, then "no" is the answer I must give when we've been hacked and the IT manager asks, "Can't we just patch our systems and put them back online?" When your e-commerce server has been breached, you can be sure that log files will be erased, common applications Trojaned and back doors installed. Unfortunately, completely reformatting your systems and rebuilding them from scratch is the only way to even begin to secure the server. Your valuable IT staff will have to be pulled from other tasks and work through the night just to bring your systems back to the same vulnerable position they were in before the attack.

Forget everything you know about the term "hacker." Corporate vulnerabilities and tools for hacking them are published on the Web daily. It no longer takes an elite group of individuals to break into your network systems. A hacker might be that corporate espionage agent you read about in Tom Clancy novels, or a terrorist with a political statement to make, but it also could be a 13-year-old sitting at Dad's computer. In any case, the intruder has scanned you and knows you're an easy target, whether his purpose is to steal corporate data, hijack your systems to attack other networks or simply hide his stash of child porn.

Why did this happen? In a phrase, "zero stated security policy," meaning you have an open security policy, whether it's in writing or not. An open security policy leaves your network vulnerable to bad IT practices, poor network design and subsequently, inadequate security.

Emphasis placed on determining how an intruder got in is usually wasted effort. If security is not paramount, one security hole plugged will just force hackers to take advantage of another. Once in, their first priority will be to erase evidence of tampering. A more important question to address is how to prevent future attacks.

At the start of any project, you determine requirements and write a systems architecture plan. There is no reason to remove security planning from this process. Include security at the beginning, and the mindset about security changes from "extraneous cost" to an integral part of the overall budget.

By putting good security policies and practices in place now, you can ensure that security isn't just an afterthought. They will protect your customers' information, reduce your company's liability and improve the overall operations of your organization in the long run. Cut costs now by improving your odds against situations that could take down your e-commerce systems, hurt your company's reputation or put your company completely out of business.

Tillman is CIO of CypherLynx, a software and security consulting service provider. He can be reached at rtillman@cypherlynx.com.

More online!

Log on to Network World Fusion to voice your opinion. Face-off authors Burton Craig and Rob Tillman will add their thoughts to the discussion.

DocFinder: 3722

(Note: Because their jobs in the security world require extra security precautions, the authors' photos have been altered to hide their appearances.)

From peer to maturity

New peer-to-peer collaboration tools offer ease of use, bandwidth savings, but the jury's still out on scalability, management and data integrity.

■ BY MITCH WAGNER

Network professionals are beginning to turn to peer-to-peer collaboration tools as flexible and efficient alternatives to bandwidth-intensive, server-based technologies.

Peer-to-peer software lets end users set up workgroups on the fly, across the firewall, for sharing documents and conducting discussions, without having to run to the IT department.

CGE&Y's John Parkinson uses Groove as a bandwidth-saving alternative to Notes for document sharing.

JOHN SUMMOLE

But IT still needs to keep some level of control to guarantee data integrity and security, so rather than pure peer projects, companies are going with hybrid networks that incorporate servers for management purposes only.

Peer-to-peer collaboration tools are still in the early stages of adoption; the largest corporate deployment we found was 1,000 users; the next largest a few hundred, and after that, deployments were measured in the dozens of users. So it remains to be seen if peer-to-peer will find its niche at the workgroup level or will scale to enterprise dimensions.

Peer-to-peer applications sometimes come in through the back door, but frequently IT executives bring in the applications to empower users and save bandwidth.

Cap Gemini Ernst & Young, a global management and IT consulting company in New York, is trying out Groove from Groove Networks with several hundred users. With Groove, users can share files by dropping them into the Groove workspace window. When a user changes a shared file, only the changes are transmitted across the workgroup, rather than the whole file, which conserves bandwidth. The shared files can be encrypted for security, and Groove also can be used for instant messaging and to host discussion threads, which can be imported from Microsoft Outlook or Lotus Notes e-mail.

CGE&Y is a Lotus Notes user. "The problem is that replication through servers is a natural bottleneck. The more people use the messaging infrastructure to support collaboration and networking, the harder it got to manage our network resources, because the patterns of usage were all over the place," says John Parkinson, chief technologist for the Americas region at CGE&Y.

The company has about 50 teams that hold virtual meetings on Mondays and another 50 that meet on Fridays. Just before those team meetings start, the entire company network drags as people download materials for the meetings. Using Groove, workgroup members can share documents directly with each other with minimal effect on the network.

The ability to communicate using familiar applications was the primary reason Amerex Energy, an energy brokerage in Houston, chose Presence-AR from Advanced Reality to automate keeping track of prices on its commodity broker-trading floor. The half-dozen brokers now using Presence-AR don't have to bother with a new, peer-to-peer application; they share documents using the Excel program with which they're already familiar, says Tito Toro, Amerex technology director.

"Excel has always been the platform of choice for them. What Presence-AR allows them to do is gather pricing information over the phone on different commodities and share the information efficiently," Toro says. Previously, the prices were tracked, written on a whiteboard and yelled across the trading floor by broker assistants.

Amerex says if the trial is successful, it will deploy Presence-AR to its 200 brokers and to clients.

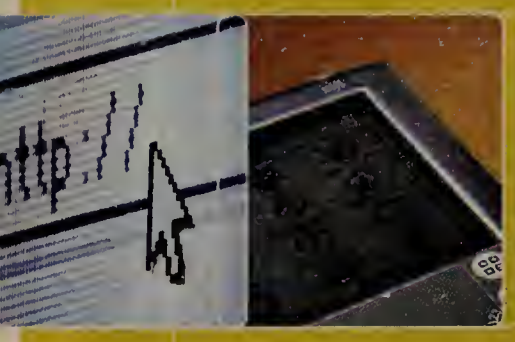
Likewise, PartNumberPlease.com uses BadBlue from Working Resources, a Web server that runs on client or server, to maintain a searchable index of computer part numbers from about 300 value-added resellers (VAR). The member companies run BadBlue on PCs with access to Excel spreadsheets of part numbers. When a customer requires a part that the VAR doesn't have in stock, the VAR can search the spreadsheets and locate another compo-

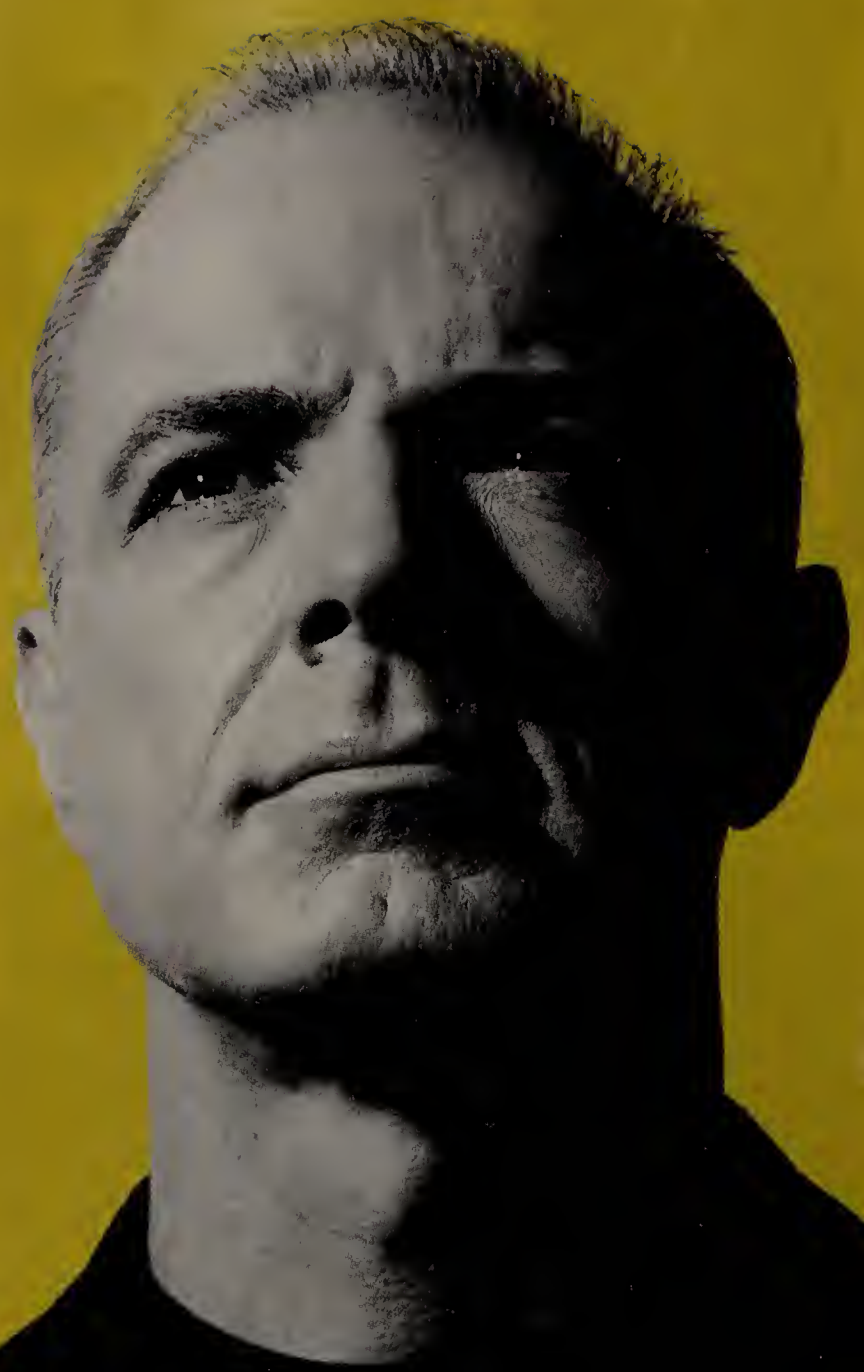
More online!

Go online to compare peer-to-peer with client/server.

DocFinder: 3729

See Peer-to-peer, page 27





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Grid-dy determination

Grid computing systems gird to move out of the lab and into the enterprise.

■ BY CURTIS FRANKLIN JR.

Stu Jackson needs CPU cycles — lots of CPU cycles. As IT architect for Incyte Genomics, Jackson designs systems that use computing resources the way a blast furnace uses iron ore. The Palo Alto firm's genomic applications burn up every available CPU resource.

Jackson doesn't need supercomputers, however. He builds his applications for pharmaceutical and biotech firms on computing grids. "For businesses that consume CPU cycles as a raw material, grids make sense in almost every case," he says.

Organizations have spent large sums of money building their computing infrastructures, which primarily consist of computers that spend a lot of time doing nothing. Harnessing those unused CPU cycles to power compute-intensive applications is the driving idea behind grid computing.

A grid computing system is a distributed parallel collection of computers that enables the sharing, selection and aggregation of resources. This sharing is based on the resources' availability, capability, performance, cost and ability to meet quality-of-service requirements.

Grids come in various sizes, from cluster grids that pull workgroup computers into a single system, to those that link clustered computers, to enterprise grids that tie computers in a single organization, to global grids that tie computers from multiple organizations into massively parallel high-performance computing engines.

There also are several types of grids, from the traditional grids that focus on aggregating CPU horsepower, to data grids that move terabytes of data between sites for analysis, to access grids that provide high-performance video conferencing and application sharing between multiple sites. Each grid, no matter the size or type, is tied together with job scheduling and management software.

Avaki, DataSynapse, Entropia and Platform Computing are four companies specializing in grid management and scheduling software. Entropia specializes in linking PCs into parallel-computing grids. The other three focus on high-performance servers and midrange computers. All are building products based on the Open Grid Services Architecture (OGSA), a standard developed by the Global Grid Forum, a trade group seeking to create a common basis for grid computing. In addition to the commercial offerings, the Globus Project has developed an open source grid framework based on OGSA standards.

Hewlett-Packard, IBM and Sun each have developed grid initiatives based on their own hardware. While each has unique elements, all claim allegiance to the OGSA standard. Dan Powers, vice president of grid computing strategy and business development at IBM, says rallying around a standard is a must for the growing grid market. "We didn't need eight different ways to build networks, so we ended up with TCP/IP. We don't need eight different ways to build grids," Powers says.

Grid to go

Grid computing's first moves out of the academic and research arenas have been into compute-intensive applications. Bioinformatics, oil and gas exploration, automotive and aerospace engineering, and financial services industries were among the early corporate adopters.

Financial services firms are using grid computing to prepare complex models of individual currencies or complete portfolios, and get the results quickly enough to trade based on the model's predictions.

Frank Cicio, COO of grid computing vendor DataSynapse, says there's no mystery behind the move. "On Wall Street, turning information around in real time that normally takes hours could mean billions of dollars. Everybody is watching the dollar, and everybody wants more for less."

Grid computing has been cost-effective for Incyte Genomics. The company moved from a 32-processor Sun E10000 to an Intel-based grid running Platform Computing's software, and Jackson's price/performance calculations show the grid is about 10 times less expensive for the same computer power.

Incyte has used some form of grid system for nearly five years. "Five years ago we were clustering 50 to 100 Alpha processors, where today we tend to use Linux on an Intel platform," Jackson says.

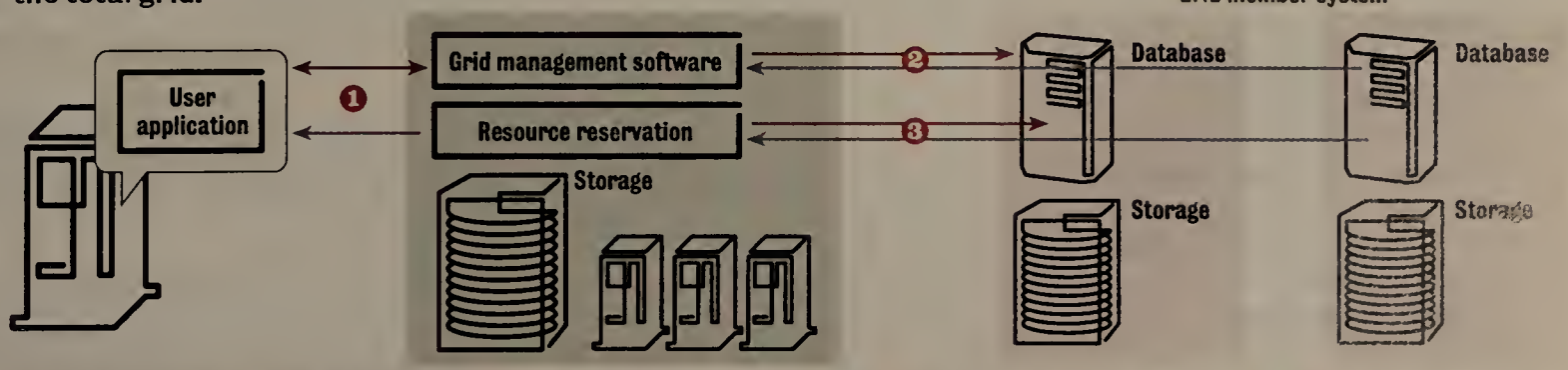
Another reason for the grid deployment is ease of upgrading. "Our first grid was 125 processors, and we've used as many as 1,000 processors for the same application," he says.

Information for life-sciences applications

See Grid, page 46

Getting it done with grid computing

Grid applications depend on the services of grid management software that coordinates use of components within the total grid.



The major components of a commercial grid system include grid-enabled user application, resource scheduling and management software, and multiple database servers.

1 Initial application request for data goes to the grid software, which reserves resources on available systems within the grid.

2 Updates take place between grid member systems and the management software, and between the management software and user application.

3 When processing is complete, the management software releases grid computers and results are returned to the user application.

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NetworkWorld Review

Sonic Foundry's MediaSite Live

Streaming presentations made easier

■ BY CHRISTINE PEREY, NETWORK WORLD GLOBAL TEST ALLIANCE

Even the most technologically inclined people find streaming-media content creation tricky; there are compression algorithms, data-rate optimization procedures and challenges in posting and integrating content and video from different systems on the viewer's desktop display.

Sonic Foundry's goal with its MediaSite Live appliance is to make producing live or on-demand rich media as easy as possible for presenters and for network or content managers — with or without a professional video producer nearby. When a producer is available, he can focus on the video composition, not the technology processing, assembly or delivery of components.

MediaSite Live 2.0b is exceptionally well-designed — it is presenter-friendly and suitable for corporate networks. By virtue of smart technology in the "capture workstation," the finished content it produces meets (and in some cases exceeds) expectations of the most demanding Web-based business audiences. For these reasons, the product receives a World Class Award.

Simple setup

The MediaSite Live system includes a capture workstation (an appliance with a 1.8-GHz Advanced Micro Devices processor and 512M bytes of RAM running Windows XP Professional), an end-user application and administration software. The appliance is full of video and audio capture, image capture and output interfaces. The customer adds one or more video and audio sources (cameras and microphones) and one or more content sources (DVD player, S-VHS VCR, LCD projector, desktop computer or laptop) via a scan converter, the built-in VGA capture interface or the auxiliary S-video or composite capture card. A professional video camera, camcorder or a video-mixing switch with multiple cameras will work as long as the device has an S-video or composite (standard RCA) interface. USB and FireWire interfaces are not supported in Version 2.0b, but Sonic Foundry says these would be included in future releases.

It took us about 15 minutes to install the MediaSite Live box in a meeting room and get a presenter to begin capturing and streaming an event to audiences. This installation time is possible only if you have a Web server, FTP server local to the Web server, a directory for storing captured images, Windows Media Services (as a part of Windows 2000 Server or Advanced Server with Service Pack 2 or later), and that you have installed Sonic Foundry's Auto-Registration Service on the video server. Because MediaSite Live also has these components built in, presenters can operate it as a standalone, archiving device. And by using the administration tools, the presenter or content manager can publish to the enterprise or service provider network later.

In the unit we tested, the administration tools were on the capture appliance. In a production environment, the administration tools are installed on a Windows 2000 Server running the Internet Information Server services. Because the tools use XML-based field formatting, one instance of the tool set manages one or more workstations. Via a Web browser, a content manager or presenter can fill in presentation-specific details, choose the level of interactivity and pick the presentation mode — live broadcast, archived local content or download for on-demand playback later. For live presentations, the audience can provide feedback, send questions or respond to a preconfigured poll. You can also build new streaming profiles or load prebuilt profiles via the administration interface.

Sonic Foundry's Navigator application is a proprietary viewer that lets Internet Explorer 5.0 or later, start, stop, decode and display video and synchronized slides in fixed positions on an attendee's screen. It also permits a viewer of a rich media archive to use a mouse to advance through the session and to link to supporting resources. A default Navigator template comes with the administration tools, but you can customize components (banner images, speaker images, links and logos) in the Web interface by changing the URL to these pages or graphic elements in the default Navigator or starting with a blank template. Although more than adequate for basic business presentations, we quickly found limitations, including a fixed Navigator video window size (240 by 180 pixels) and the layout of graphic elements. A user can, by right-clicking in the video window (or on the Navigator window button labeled "full size"), make a video window full-screen. Sonic Foundry says it will add more Navigator customization options in future releases.

Once powered, the MediaSite Live system can obtain an IP address from the Dynamic Host Configuration Protocol server or be manually configured. On the network, MediaSite Live automatically initiates the Auto-Registration service on the locally configured Windows Media Server. By building on Windows XP Professional's media-savvy components, Sonic Foundry's complete integration spares users and managers compatibility issues commonly found in home-grown solutions or even other pre-integrated solutions (such as Pinnacle Systems' StreamGenie Presenter with SoftTV software or ViewCast's Niagra Max with Accordent software, which used earlier Windows operating systems).

Capturing the presentation

When the presenter is ready, the capture application can be launched on the workstation. After authentication and selection of a presentation, the application opens the capture-monitoring interface; detects the video, audio and images sources; and displays previews. Because the image synchronized with the video and audio in the Navigator window is captured directly from the presenter's local display, there are virtually no restrictions on what the presenter can do during a streaming session. In contrast to other slide and media synchronization tools, there is no need to preload a presentation in the capture workstation or on a server. Whatever the presenter does on the display system is what will be streamed and archived.

To minimize the complexity to the presenter and maximize the audience experience, MediaSite Live's architects went beyond their peers and surpassed our expectations. Without any involvement by the presenter or a local operator, Sonic Foundry's capture application analyzes the presenter's images and makes sure that the image quality captured and streamed (live or to disk) is the highest possible quality in all of the many circumstances the presenter might choose. When using a desktop ap-

Net Results

WORLD CLASS Winner

MediaSite Live 2.0b with built-in image capture hardware

4.5 RATING

Company: Sonic Foundry (Media Systems division), (877) 783-7987, www.sonicfoundry.com/systems **Cost:** $21,950 for full starter system with administration tools license; $19,950 for subsequent systems. **Pros:** Easy to set up; easy for presenter to use; suitable for live or on-demand applications; easy to manage on network; produces high-quality results easy for audience to experience and, in the case of archives, to navigate. **Cons:** Needs more customizable Navigator templates, support for formats beyond Windows Media.

What's the score?	MediaSite Live
Features 50%	4
Management/administration 20%	5
Installation 20%	5
Documentation 10%	5
TOTAL SCORE	4.5

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

plication or surfing the Web, the presenter's screen content can change very rapidly. When creating a PowerPoint presentation, a user typically narrates and the screen does not change until the next slide is requested. The MediaSite Live capture application automatically senses the content changes. By capturing images only when necessary, MediaSite Live saves in bandwidth and processing power. As the source content changes the application automatically adjusts the image capture rate and handles all synchronization. Presenters also can adjust the settings in the capture application to enhance image contrast, clarity (sharpness) and pixel depth before beginning a capture session.

Image quality is important, but the presenter's voice must also be clear. Our tests with videoconferencing systems from

More online!

Find out how we conducted our tests and find screen shots of the application online.

DocFinder: 3728

Polycom and VCON using a table-top microphone resulted in a slightly "tinny" voice quality when compared with a clip-on lapel microphone used when testing with a Panasonic miniDV camcorder. Where a stationary microphone is the audio source, MediaSite Live's Automatic gain control continuously optimizes the input. If the speaker moves relative to the microphone or if any other audio input conditions change, the system adjusts the input volume and provides a constant audio output to the Navigator.

Documentation

The MediaSite Live 2.0b server guide is an exemplary document. The documentation and the companion "user guide" devote an optimal amount of space explaining topics such as capture and publishing workflow — and screen shots complement the text.

The proof that the "whole is greater than the sum of its parts" is at the point where the media meets the audience — this is what earns MediaSite Live our World Class Award.

Perey is president of Perey Research & Consulting, a market research and business development consulting company helping companies design and deliver networked multimedia solutions to market. She can be reached at cperey@perey.com.

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Grid
continued from page 43

also is the focus of the North Carolina Bioinformatics Grid Project in Research Triangle Park, N.C. Phil Emer, chief architect for the project, says the organization has built a grid incorporating hardware and software from Avaki, Platform Computing, IBM and Sun.

Emer says the project didn't start with the goal of building a grid; the grid architecture grew out of the needs of several organizations. "By the time we looked at our requirements — high-performance computing, high scalability, user interface transparency — we had described a grid," he says.

The grid spans computers at three universities, several commercial and government research facilities and the North Carolina Supercomputing Center. Emer found the organizational and accounting challenges were at least as great as the technology hurdles. "The human policies are significant issues. You have to put in place enough monitoring applications to prove to institutions that, by cooperating with the grid, they'll get out more resources than they put in," he says.

Grid computing was a good choice for getting start-up Butterfly.net to take flight. Developers of a framework for multiplayer online games, Butterfly.net sees the demand for computing resources vary in a short time, says Butterfly.net CEO David Levine. The company built its infrastructure on Globus because of its ability to run on a Linux platform and uses IBM's global grid to provide resources for game developers and players around the world.

While the largest game hosted so far has about 50,000 concurrent users, Levine says they have to prepare for more. "Some games being ported over from China already have millions of players, so when we first put the infrastructure in place we had to have resources for a million players," he says. The company's contract with IBM let it underbuy in the early stages of the company's life, but scale to accommodate more users as needed.

Grinding gears

Grid computing architectures provide advantages in performance and flexibility, but there are still issues keeping many companies from leaping too quickly onto the grid bandwagon. Questions of scheduling and management, security and accounting make grid computing a risky proposition for many IT executives.

More online!

See what research groups are doing to promote grid computing.

DocFinder: 3727

Patricia Kovatch is manager of high-performance computing at the San Diego Supercomputer Center (SDSC). She's involved in building the TeraGrid, a large grid connecting systems at four premier high-performance computing centers — SDSC, the National Center for Super-computer Applications (NCSA), Argonne National Laboratory and Cal Tech.

Scheduling and management issues present a big challenge in building the TeraGrid. "You need a metascheduler so each piece of the program can run on different computers at the same time. The tasks have to talk to each other and make sure that data is returned to the central control portion of the application. There are still a lot of problems that aren't solved, and that's part of what this project is about," she says.

When computing resources are aggregated, security can become a significant issue. The basic issues of user authentication and access control suddenly are multiplied by the number of clusters, departments or organizations that link to form the grid. Questions of who can create a job of a particular priority, which resources can be accessed and other questions are part of any grid that multiple users can access.

Standardizing methods for enforcing policies — such as security and financial — is a major thrust of standards efforts such as the OGSA. While major players in the industry are behind the standardization effort, the history of technical standards committees is not filled with standards developed as quickly as the market would like.

There's also the issue of who pays for all those CPU cycles. The accounting applications are made more complex because the task is not simply about traditional IT costs, says Bob Fabbio, CEO of software developer Vieo.

"You're setting up a financial marketplace in the computing center, so you're matching supply and demand," he says. "You have to look at application service levels and have a sophisticated understanding of the infrastructure beneath the application." Accounting management for grid systems has not developed at the same rate as application support. Until corporations can adequately account for the use of resources, grids will remain platforms for single applications rather than many applications for a variety of departments.

The combination of security, administration and accounting issues has resulted in most grids being centered around computers from a single vendor or based on a single operating system. Though the promise of grid computing is shared resources regardless of the underlying platform, building a grid based on multiple hardware and operating systems involves massive customization efforts.

Even single-platform grids are custom efforts today, and few organizations are willing to commit to that level of additional effort.

The future grid

Though commercial grids still are moving through the early adopter stage, Levine is bullish on the technology. "In five years, I can't imagine a company not using a grid," he says.

Other observers are more cautious about the time scale, but not the ultimate results. "I really do think [grids] will become the way to share resources within and among enterprises," says Jane Clabby, research analyst at Bloor Research. "Within five to 10 years we'll be talking about grids the way we talk about the Internet today."

Franklin is an editor and writer in Gainesville, Fla. He can be reached at kg4gwa@arrl.net.

Peer-to-peer
continued from page 41

that has it.

BadBlue lets PartNumberPlease.com provide a low-cost alternative ($200 per month) to centralized data stores, which typically cost about $1,750 per month.

U.K. Pharmaceuticals giant GlaxoSmithKline is trying Groove with workgroups of 20 to 30 users each, totaling about 1,000 users, says Philip Connolly, formerly GSK's vice president of IT communications.

GSK uses Groove for collaboration between its employees, outside attorneys and hospitals. In one case, Groove scientists collaborated with researchers at a hospital not owned by GSK on genetics research. The work involved sending large visualization documents back and forth. Previously, because of security considerations, researchers burned documents onto CDs and sent them back and forth via FedEx.

GSK didn't want to send the files over the Internet without encryption, and e-mail encryption is difficult. But with Groove, encryption is automatic, Connolly says.

Groove also allows for collaboration between people inside and outside the firewall, without having to reconfigure the firewall, he says.

"Notes is a tool for big projects with lots of data that last a long time. Groove projects are quite short. Three or four or 10 or 15 people work on Groove for a month or two, then they take it down and move on," Connolly says.

Servers are still needed

Hybrids of peer-to-peer and client/server are the future, says Meta Group analyst Matt Cain. "You need a server in there for adult supervision," he says. Groove users found they needed the server for archiving — one user accidentally deleting a document would delete the document from every machine in the workgroup.

The server gives management control over who has access to information, says Robert Batchelder, an analyst with Gartner. Administrators need to be able to lock out access to employees who change jobs or leave the company. "There needs to be shared control," he says.

Wagner is a writer in San Diego. He can be reached at mwagner@TheWorld.com.

Management

Strategies

- CAREER DEVELOPMENT
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- BUSINESS JUSTIFICATION

Community minded curriculum

Two IT executives share why community colleges are tops for entry-level network technicians.

■ BY LINDA LEUNG

What do businessman/politician Ross Perot, actor Dustin Hoffman and Black and Decker Chairman and CEO Nolan Archibald have in common? They are alumni of community colleges — publicly funded higher education establishments that provide vocational training and associate degree programs to students regardless of wealth, heritage or previous academic experience.

Such learning facilities give students practical training to enter the IT field. "Community colleges are good at providing work-ready skills. Students receive training to do entry-level jobs and are able to move into higher positions," says Jerry Bunce, IT education relationship manager at aviation company Boeing.

George Boggs, president of the American Association of Community Colleges, says these institutions are becoming the new graduate school. For instance, 28% of the current 6 million noncredit students — those not studying for credit towards a university — already hold bachelor degrees. Nearly half of all students work full time.

According to Boggs, community colleges have seen double-digit increases in enrollment over last fall, although he could not provide exact figures. "Some students may be out of work and want to pick up new skills," he says.

Boggs says community colleges aim to provide students with not only technical ability, but also communications skills such as writing reports and giving presentations. This knowledge would make candidates more desirable to employers.

David Luchtel, CIO at Pemco Insurance in Seattle, agrees. "When the job market heats up, most kids will need to have degrees to get high-paid jobs. But it is also very important to have interpersonal skills."

One college that has taken that notion to heart is Bellevue Community College (BCC) in Washington, which offers an associate in arts degree in IT and network support. An advisory board consisting of seven local companies, including Boeing and Pemco, support the college.

BRIAN RASZKA

The advisory board meets three times per year to ensure BCC's programs help to produce graduates with work-ready skills. As such, BCC's students are taught "business survival" skills, says Michael Littlefield, program chair of the IT networks support program at BCC. "Students are given projects and research assignments that simulate those in business environments.

For example, students had to design a network for the school district and present that at a management review, so they learned about presentation skills, the research process, design specs, and so on."

Although many potential employers might have hiring freezes because of the depressed economy, companies still are looking to community colleges to groom the next generation of workers.

Boeing is particularly supportive of community colleges because of what Bunce describes as their willingness to work closely with industry to ensure students receive relevant practical and academic training. Boeing works with 62 community colleges to promote excellence in education and diversity in student body and faculty staff for the training of existing and future Boeing employees, Bunce explains.

Along with recruiting community college graduates into IT positions — 235 of Boeing's 10,000 IT workforce have associate IT degrees from BCC — Boeing has contracted BCC to provide Cisco and Microsoft certification training to its employees. Boeing has been an active member of various BCC advisory boards for the past seven years.

In September, BCC introduced its Computing Security Professional Certification program in response to a request from Boeing. Developed in conjunction with Boeing's network experts, the post-graduate level program covers structured methodology for securing a network and collecting computer forensics.

"There is a shortage of people who have the training and/or education in computing and network security. We would like to hire people with this training," Bunce says.

BCC also altered the focus of its degree program to include documentation skills in response to student feedback and suggestions from the advisory board. For example, practical class projects are now marked on how well projects are documented and the technical aspects of the networks.

Community colleges such as BCC are breeding grounds for a diverse population of potential IT employees. Of the 270 students enrolled in BCC's IT degree program, 10% came straight from high school, and 90% are nontraditional students. A full 75% are already employed, while 45% work in tech-related fields.

BCC's Littlefield says that in his past experience, between 70% and 90% of graduates find network jobs in support roles. "It is not reasonable for graduates to expect to become network engineers [with a community college degree] but they could be placed in a support role."

Bunce agrees with that assessment. "Community colleges are better for entry-level positions such as PC support and networking technicians," he says.

"University graduates would be over-educated for those positions; they want to be network designers or programmers," he adds. ■

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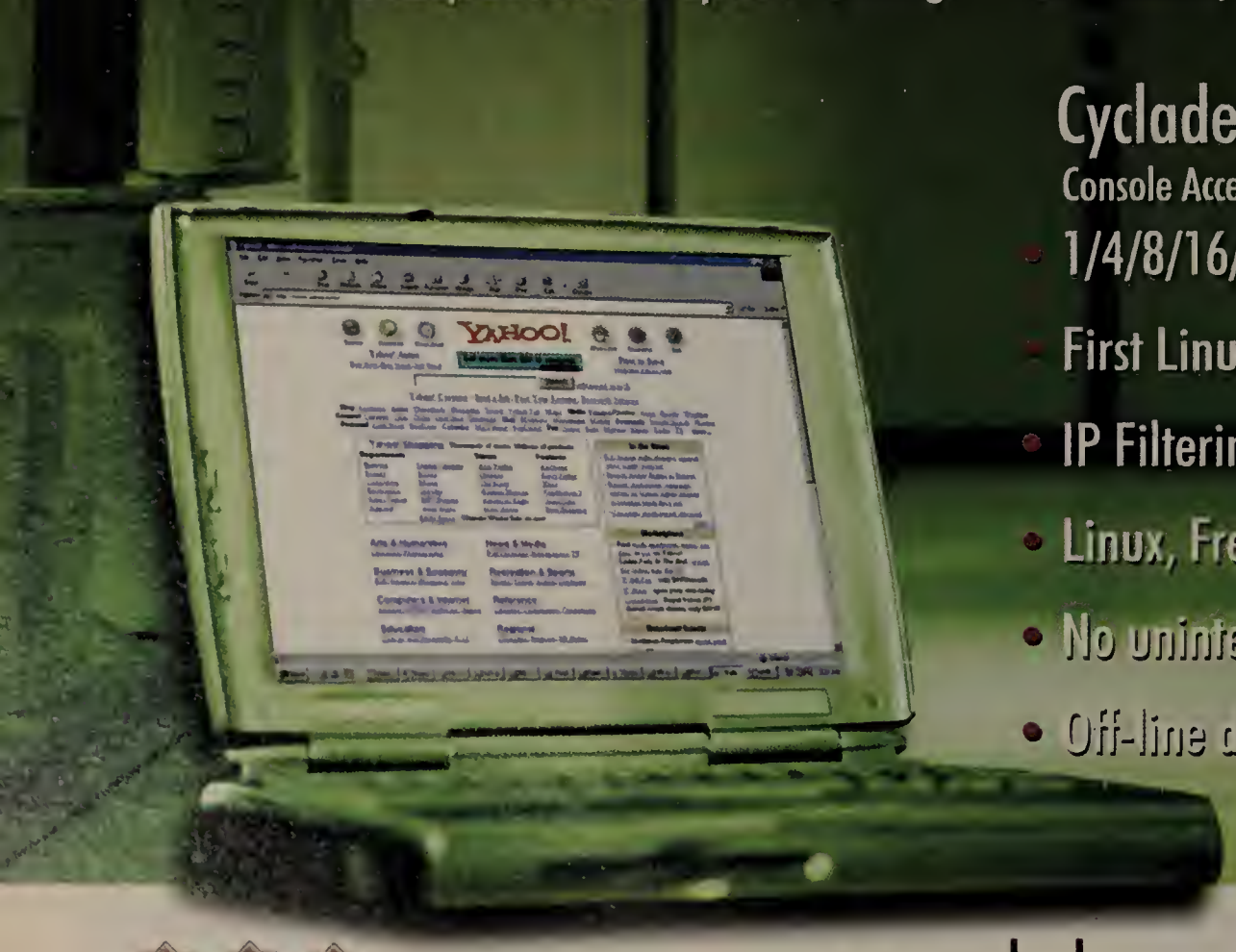

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Several computer related positions available for large software development, support and sales company. Degree, technical skills & experience vary per position. Send resume to Susan Stubbs, MAPICS, Inc., 1000 Windward Concourse Parkway, Suite 100, Alpharetta, Georgia 30005.

GIS Software Quality Control Specialists: GIS Software test planning and preparation. Generate test cases and scripts using geographically referenced data, report and coordinate test activities, execute test scripts, record results in a defect tracking pool and implement sound QA testing practices using GNIS, LODE data, GE Small World, Framme, Microstation & Autocad. Communicate and resolve QA issues with Programmers and Developers. Develop & initiate quality standards for new software tools to implement new versions of GIS. 2 years exp. in job offered required. Think Resources, Inc., Attn: GIS Recruiting, 280 Technology Parkway, Norcross, GA 30092. No phone calls please. EOE.

PROGRAMMER/ANALYST (MULTIPLE OPENINGS) Conversion of legacy character-based Progress Relational Database Management System/4GL software application to graphical-based software application for Unix and Windows platforms, including same Windows applications to be Web-enabled using ASP. Must have Bach. Degree in Comp. Sci., or rel., or foreign degree equiv. Must have 2 yrs. Exp. In job offered, or 2 yrs. Exp. As Software Devl., or related, or any suitable combination of exp., training and/or education. Hrs. 8a-5p. M-F Please send resume to Thomas G. Traylor, Jr., Corp. Sec., Progressive Data Systems, Inc., 900 Old Roswell Lakes Pkwy, Suite 330, Roswell, GA, 30076 and reference ad #GOJ001.

Programmer/Analysts: Design, develop, validate and implement specialized Laboratory & Pharma related Management Information Systems in LIMS Lab-Manager environment (FDA regulated environment) conforming to cGXPs and 21 CFR Part 11 pertaining to electronic records and signatures. Prevailing wage/benefits. HR, enGenius Consulting Group, Inc., 3100 Breckenridge Blvd., Ste 100, Duluth, GA 30096. EOE.

Business Analyst (F/T) wanted by Elmhurst, IL company. Develop, implement, test and maintain financial report systems using Baan software. Requires BS & 5 years experience. Reply to C. Ther, Scholle Corp. Suite 300, 360 W. Butterfield Rd, Elmhurst, IL 60126.

Business Development Rep. Tech Products, Level I, for Roseville, CA. Req. B.S. Degree in electronics or computer engineering. Must be skilled in use and implementation of CAD and GIS software and hardware. Mail Resume to H.R. Dir., ID8 Media, 2070 Allston Way, Ste. 3, Berkeley, CA 94704.

Systems Analyst (LAN/WAN): maintain & configure servers, firewalls, routers, layer 2/3 switches, T-1 & dial-up lines. Safeguard data security using CISCO Pix Engines, router access-list/packet filtering. Use Cisco routing, Spanning Tree Algorithms (STA), VLAN, VLAN Trunking, LAN/WAN technologies (CSU/DSU, PPP, HDLC, T3, T1, ISDN, IPSEC Tunnel) and TCP/IP (RIP/OSPF/BGP Routing) TCP/UDP Packet Flows. Monitor & analyze network. Microsoft Certified Systems Engineer with Cisco Certified Networking Professional certificate required, along with Bachelor Degree in Computer Science, Electrical Engineering or related and 3 years experience. Send resume only to: CW 214, c/o National Medical Health Card, Inc., 26 Harbor Park Dr., Port Washington, NY 11050. No calls or e-mails please.

Computer Hardware Engineer to develop and support computer systems, including hardware and software, utilizing Network+, MSCE, CCNA and CNA. Requires Bachelors degree in Computer Science or equivalent. Please send resume to Jen Hsueh Chang, Microcomp, Inc., 404 Boston Post Road, Orange, CT 06477 (203) 799-0431.

Operations Manager-for Int'l. Division of educational trading co-Assist w/maintenance of international network including DSL and/or T1 lines. Assist w/maintenance of Realtime Trading Room User Ids & processing of Latin American clients. Min Req. Bach in CS or equiv.+ 4 yrs exp. Resumes: Pristine Capital Holdings, 200 S. Biscayne Blvd., #4700, Miami, FL 33131.

Web Applications Developer wanted for a Spanish-language online network to analyze, design, develop, test and maintain web based associated applications. Bachelor's degree in Computer Science or Engineering, plus 3 years experience. Send resume to: Univision Online, Inc., 605 Third Avenue, 26th Floor, New York, NY 10158, Attn: Human Resources.

SOFTWARE ENGINEER wanted by specialized software co. in Houston, TX. Must have Computer Science degree. Respond by resume only to: Mr. D. McCallum, X/S-#10, Energy Graphics, Inc., 12121 Wickchester, Ste. 400, Houston, TX 77079.

Ouad/Graphics: SOFTWARE DEVELOPERS: Sussex, WI, Job Title: SOFTWARE DEVELOPERS. Job Type: Full-time. Company Name: Ouad/Graphics, Sussex, Wisconsin, Country: USA, 53089. N63 W23075 Main St Sussex, WI. 53089.

Selected candidates will be part of team responsible for full-life cycle software development. BS in Computer Science or related major required for all positions. Additional requirements for: Software Developer - experience with OO programming (C++, Java, PowerBuilder) plus relational database (SQL). Programmer Analyst I - experience using Powerhouse, VB and SOL/Oracle DB. Overtime as needed, including evening/weekend hours to support 24/7 operations and minimize user disruption.

Multiple openings available for exp'ed Prog/Systems Analysts, DBAs and Software Engineers. Duties include but not limited to developing and designing s/w systems using SAP, ABAP/4, Mercator, COBOL, CICS, VB, Power Builder, Developer 2000, Java, HTML, Sybase, Oracle, MS SQL Server, wireless/internet/telephony technologies, e-commerce, data warehousing, UNIX/Windows systems administration. All positions require a BS/MS or its foreign equivalent. Competitive salary. Some travel/relocation required. Send Resumes to: UNILINX, 4625 Alexander Drive, Suite 110, Alpharetta, GA 30022

Programmer Analyst. 8a-5p. 40 hrs/wk. Analyze, dsgn, dvlp, prgm & implmt business applics using Java, Javascript, Active Server, VisualBasic and HTML. Bach or equiv degree in Comp Sci/Engg or Info Systms, Electrical or Electronics Engg or related field. 2 yrs exp in job offd or as Systms Analyst or Prgmr. Resume: Avalon International, Inc., 3550 Engineering Drive, Suite 260, Norcross, GA 30092.

Advansoft (Soft O Soft) Is looking for program or system analysts, IT engineers. Candidates must have degree with work permit in US. Exp. in IT area such as Oracle, SQL, WebLogic, WebSphere, C/C++, client/server, Java is plus. Please contact info@advansoft.com. EOE.

Programmer analysts or software engineers wanted by Business Solutions 21. We are small but stable and wage is higher than big companies. Applicants will analyze & custom design software, must have BS. Please send resumes to 3654 Okemos Rd, Okemos, MI 48864, Attn: Danesh. EOE

Software engineers/system analyst wanted by IT Talent World. Candidates will work for our clients in Chicago area or other locations. Must have BS or equivalent with min one-yr experience. Skills in Oracle, SOL, Java preferred. Apply at resumes@ittalentworld.com. EOE

Paradigm Infotech is looking for programmer/system analysts, s/w engineers. Candidate must have BS with at least one-year IT experience. Good skills in C/C++, Java, Oracle, WebLogic, VB, HTML are plus. Traveling is required. Apply jobs@paradigminfotech.com. EOE

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1 position: Knowledge & ability to teach contemporary programming languages: C++, C#, Visual Basic, Java, etc., operating systems: windows & Unix, computer applications programs: Microsoft Office, & various networking environments: Windows NT/2000 Server &/or NetWare 5/6 are required. Prefer certification in one or more: MCT, MCSD, MCSE, MCSA, CCNP, CCNA, CNE, CNA, CIW, SCSA, OCA, OCP, A+, i-Net +, Linux+, Network+, &/or Server+. Must be an advocate of Student centered learning, energetic, enthusiastic, & willing to learn new advances in technology.

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On-line application: www.broward.edu/FCCSC/apptrack/applogon.jsp or 800-682-3646/954-201-7338.

Submit application packages to: Broward Community College/ HR, 225 E. Las Olas Blvd., Ft. Lauderdale, FL 33301. BCC is committed to the principle of diversity. We are interested in receiving applications from a broad spectrum of people including women, minorities, veterans, & disabled individuals.

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Consultant Software Engineer to design and develop Watch List integration system with wireless paging; Palm Pilot and cell phone capabilities to allow stock trading on these devices, and to allow users to receive alerts for these created watch lists on any wireless device as pager, phone or palm hand-held devices. Will develop object-oriented code in C++, JavaScript, HTML and XML on Unix and PL/SQL on Oracle. Requires Bachelor's degree in Computer Science, Computer Information Systems, Engineering, Math, or Physics plus five (5) years experience in Job Offered OR five (5) years experience developing client/server applications OR, in the alternative, Master's degree in Computer Science, Computer Information Systems, Engineering, Math, or Physics plus three (3) years experience in Job Offered, OR three (3) years experience developing client/server applications. Candidate must also possess demonstrated expertise in object-oriented ("OO") programming in C++ in a UNIX environment; and demonstrated expertise developing web-based applications in HTML and JAVA. Salary: $88,000/yr, M-F, 9AM-5PM. Send 2 resumes to Case #200114373, Labor Exchange Office, 19 Staniford St., 1st fl., Boston, MA 02114. EOE. Applicants must be eligible to accept full-time employment in U.S.

J.D. Edwards is a one billion dollar global software company that is enabling collaborative commerce in the connected economy. We currently have openings in a number of areas, at all levels, including: software developer, business software developer, programmer/analyst, internet programmer, software quality assurance engineer, business software quality software engineer, technical consultant, web developer, database administrator, technical specialist, technical support specialist, applications consultant, and other IT positions. Positions are available at our world headquarters in Denver and at other locations throughout the United States including San Francisco, Costa Mesa, California, Chicago, Texas, New Jersey, Boston, Charlotte, N.C., etc.. Please visit our website for a complete listing of available job openings, locations and other information: www.jdedwards.com. J.D. Edwards is an equal opportunity employer.

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Programmer Analysts: Plan, test and develop Internet based programs for ERP packages, customer relationship management, sales force automation and E-commerce. Design and develop client-server applications using JAVA, ASP, VB, C, JavaScript, and AutoCAD2002. Interact with clients to design the functions of software according to client specifications. Requires Bachelor's degree in Computer Science or Engineering or a related field and 2 years of experience.

Send Resume to: HR Dept., U.R. International, Inc., 12790 South Kirkwood, Stafford, TX 77477 or via email at: jobs@urinternational.com

SOFTWARE ENGINEER: Demonstrated ability in design and development in client/server architecture using Oracle database and Oracle software development tools. Proven ability in analysis, design and development of software projects involving GUI front-end tools like Power Builder 4.0, Forms 4.5, Reports 2.5. Extensive knowledge in design and development of software projects using UNIX operating systems and Windows and software developing languages like C and Pascal. The job duties are: Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements, study existing system to evaluate the effectiveness; upgrade systems presently in use; develop, test, and implement new software; observe functioning of newly implemented systems and programs for trouble areas; correct systems/programs as necessary. Requires Bachelor's in Information Systems or equivalent with two years experience in software development. 40 hours per week at $65,000 per year. Please send 2 copies of resume to Case #200113348, Labor Exchange Office, 19 Staniford St, 1st Floor, Boston, MA 02114.

Computer

AlphaSoft Services Corp. is a rapidly growing systems integration & consulting services provider. We are currently recruiting for the following f/t openings in Walnut Creek, CA:

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Software Analyst needed at client sites to analyze, dsgn, dvlp, maintain websites & s/ware using Visual Studio, XML, SQL, COM/DCOM, ASP, MTS, ATL, MSMQ, VB. Apply to WebXL Systems, 147 Columbia Tpke #301, Florham Park, NJ 07932.

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Western New York based manufacturing company seeking top quality candidate who could grow to CTO position. Requires BS, MBA preferred. ERP major application implementation, strong manufacturing systems. Experience building fault tolerant environments, Internet technologies and a demonstrated background in developing successful architecture and technologies Proven strengths in system development methodologies and ability to present complex technical solutions to senior management. Exceptional compensations. benefit package Respond to Personnel Resource Inc. via email prinorth@perresource.com

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NET2S is a leading International Consulting and Engineering firm specializing in communications technologies We are presently seeking to fill the following positions:

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Develop and implement marketing strategies. Manage sales life cycle including client presentations and negotiations. Oversee project management including deployment and roll out. Co-manage project center.

Must possess excellent communication skills as well.All positions require BS/MS degree with a minimum of 2 to 3 years of experience in the field. Must possess excellent communication skills as well.

NET2S, 82 Wall Street Suite 400, New York, NY 10005; Fax: (212) 279- 1960; Phone (212) 279-6565; or Email: jobus-ny@net2s.com

Programmer Analysts needed for Madison, WI. Seeking qual. candidates possessing BS or equiv. and/or rel. work exp. Work with 3 of the following: SAS, Business Objects, Informatica, DB2, Oracle, SQL. Fwd. resume & ref. to Information Resource Group, Inc. 911 Westwood Dr., Jefferson City, MO 65109. An Equal Opportunity Employer/AA: M/F/D/V.

SENIOR SOFTWARE ENGINEER: Full range of programming responsibilities of Clockwork32-Time and Billing application as well as Client Profile Financial Management System used in law firm practice case management. Requirements: Bachelor's degree in Computer Science and proven knowledge and 3 years of experience in accounting in a time and billing environment, financial system writing, Progress 7 & 8 Server DBA, Microsoft SQL Server 2000 DBA, Implement performance tuning, develop and maintain database schema and Multi Database application development. Must have the following Skills: Progress 4GL versions 7 & 8, Progress User Interface Builder version 8, SQL Programming, COM component programming, Crystal Reports 8 & 9 development tools, XML. Send resume to Jose Fernandez, HR Mgr., Client Profiles, 1215 Hightower Trail, Building A - Suite 200, Atlanta, Georgia 30350.

SOFTWARE ENGINEER: Boston-based internet company has an immediate need for a Software Engineer responsible for developing, maintaining and documenting applications and programs for the Linux operating system using high-level programming languages such as C, C++ or Java and scripting languages such as Perl. Responsible for all development phases and coordination with other team members and associate departments.

A bachelor's of computer science or related degree, and knowledge of Java and scripting languages such as Perl required. We offer a competitive salary, excellent benefits, and a great work environment.

Please forward your resume and cover letter to Keelyn Collins, Ximian, Inc., 401 Park Drive, 3 West, Boston, MA 02215.

Software Engineer: Harrisburg, PA. Responsible for process analysis, reengineering, architecture and development of IT solutions for complex business systems. Use tools like Java, C, C++, Visual Basic, Sybase, SQL Server, Rational Rose, ERWIN, and legacy systems (IBM/NCR/Unisys). Configure TCP/IP LAN/WAN environments and Windows/UNIX systems. Job involves active involvement in business planning/delivery and coordination with sales. Requires: BS or equivalent in Comp. Sci or Electronics Engineering and 4 years of relevant experience. Exp must include use of at least four mentioned tools and involvement in business systems planning, presentation and delivery. Competitive salary. Mail resume to HR, Shreem LLC, 2121 Queens Drive, #B-2, Harrisburg, PA, 17110. Fax: 866-269-9273 Ref: TRK4390

Picobyte Consulting is looking for programmer/system analysts, software/project engineers. Candidates must have BS/MS with minimum 1-year exp. in the IT or engineering field. Strong skills in EJB, Oracle preferred. Apply at 1500 S. 6th St., Ste B, Springfield, IL 62703. EOE.

Corpus is seeking IT professionals/engineers. Qualified applicants must have BS with 1yr/min exp. Skills in SQL, PL/SQL, COBOL, C/C++, VB, SAP, TCP/IP, NT, Java, XML, COBOL, ERP (PeopleSoft, AR/AP), XSL, ASP, Oracle are plus. Sent resume to info@corpusinc.com. EOE

Lending Tree has an opening for an E-Business Data Exchange/Interface Developer to provide e-business/automation solutions to our customers and clients. The successful candidate will develop/support computer software applications for extensive data translation and transmission functions, specifically for custom industry format standards, including Desktop Underwriter 3.0, Mortgage Industry Standards Maintenance Organization XML, Interactive Financial eXchange XML and CSML. Key technologies include the use of specialized software development tools, specifically object-oriented Perl programming, TCL/TK application (Ajuba), BizTalk & XML programming in Visual Basic, Active Server Pages, Perl & TCL/TK in a Windows NT operating system using SQL Server databases. Utilize business systems development experience in implementing e-business interfaces for online transactional processing & data exchange. Will also document, train & support implementation personnel on operations of developed systems; participate & contribute to team development/planning environment & systems testing, problem determination & resolution. Minimum qualifications are a Bachelors Degree in Computer Science, Engineering, Mathematics or related discipline/US equivalency with 2 years experience in the skills/tools/technologies as described above. Please submit your resume to: Lending Tree, Inc. Attn: HR, 11115 Rushmore Drive, Charlotte, North Carolina 28277.

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NET2S is a leading International Consulting and Engineering firm specializing in communications technologies. We are presently seeking to fill the following positions:

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All positions require BS/MS degree with a minimum of 2 to 3 years of experience in the field. Must possess excellent communication skills as well.

NET2S, 82 Wall Street Suite 400, New York, NY 10005; Fax: (212) 279- 1960; Phone (212) 279-6565; or Email: jobus-ny@net2s.com

Programmer/Analyst to: Plan, develop, code, & test comptr. progrms for biz. systems custom'd to meet info. requ'mts of non-profit engineer-based member society; develop client/server applic. to meet biz. requ'mts; consult w/ clients to determ. progrm need, objective, & input/output requ'mt; analyze & define requ'mts for data, workflow, logical process, system interfaces, hardware & OS environmt.; develop plans re steps, cost & timetable for developing progrms; create autom. report & manage d-base mainten.; assist in test of developed applic. code; monitor performnce of progrms post-implement.; write documentation re progrm development, logic, coding, test, & correction; support & maintain applic.; identify software techn. gaps; eval. software & hardware option to assist in progrmming or use as platform; assist in developmnt of progrm standard; conduct perform. diagn. & tuning; analyze & alter progrms to increase efficiency; interact w/ product mngr. to analyze customer x-action data from book & product sales, subscription, trade show exhib., training & event registration, & membership aspects of non-profit society to facilitate strategic biz. decision; liaise with user groups, system engineer & outside consultants re comptr system; train end users & technic. staff on applics.; provide tech. assistance to program users. Duties involve Relat'nal D-base develop. (SQL based), iMIS, OMNIS, Oracle, Windows NT, Great Plains eEnterprise, MS SQL/Server, Visual Basics, MS Office Suite, Crystal Reports & Mail Verify. Requ'mts: Bachelor degree in Computer Science or Information Systems or related field, PLUS 2 yrs. exper. in job offered or 2 yrs. exper. in financial biz. applic. systems development & d-base mainten. Compet. Salary; 8 a.m.-5 p.m., M-F. Location: RTP, NC. Send resume to: Molly Rodgers, HR Director; Attn: DOL-SD-1; ISA; 67 Alexander Drive; PO Box 12277; Research Triangle Park, NC 27709.

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Assistant Vice President of MIS is sought by int'l bank in NY to manage bank's Int'l Banking Financial Info. systems, SWIFT Alliance, general ledger, securities lending systems using Unidata, Oracle, SQL Server, MSAccess, IBM RS/6000, Windows NT, Java and VBA. Req. Bachelors in Comp. Sci. with 3 yrs exp. in job. Send resume to Mizuho Trust & Banking Co (USA), 666 Fifth Ave., Ste 802, NY, NY 10103 Attn: HR-QA. EOE.

SENIOR SYSTEMS ANALYST/PROGRAMMER: Responsible for the design, development, maintenance & support of highly sophisticated application software programs utilizing programming in Cobol, CICS, Unix Shell Scripts and JCL on Windows NT, MVS and Unix-based operating systems. Assist in analyzing and validating data by writing complex SQL queries to access data from DB2 database utilizing QMF. Follow change control rules by utilizing Version control environment ENDEVOR. Participate in debugging process utilizing tools such as XPEDITER, SMARTTEST and INTERTEST. Conduct DB2 data management and VSAM file handling utilizing FILE-AID. Conduct performance and model testing, report generation, troubleshooting and coding. Participate in process design and development, end-user training and systems support. Minimum requirements: Four (4) years of experience in the job offered or as Systems Analyst or Programmer. The four (4) years of experience must include the design, development, maintenance and support of software applications utilizing programming in Cobol, CICS, VSAM, Unix Shell Scripts, DB2, QMF and JCL on Windows NT, MVS and Unix-based operating systems; version control utilizing ENDEVOR; debugging process utilizing XPEDITER, SMARTTEST and INTERTEST; and experience utilizing FILE-AID for DB2 data management and VSAM file handling. 40 Hours/Week. 8:00AM - 5:00PM, $61,275 per annum. APPLICANTS MUST SHOW PROOF OF LEGAL AUTHORITY TO WORK IN THE U.S. Send resumes to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605, Attn: Shella Lindsey; Ref. V-IL 41198-L. AN EMPLOYER PAID AD; NO CALLS - SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

TX. Software development Company Seeks programmer Analyst to assist in all phase of SDLC in Analysis, Design, Code, Test and Implementation of applications and RDBMS design using Object oriented analysis and design techniques. Min. Req: BS in Computer Science or equiv. with 2 year work experience using C/C++,MFC,ATL,DCOM,ASP, J2EE,Java,EJB,Servlet,JSP,JMS,JNI,DB2,Websphere,SQL,PLSQL,Oracle,Developer 2000,UNIX scripting, UML, Rational tools on WinNT/2K & UNIX. Send Resume to HR. Dept.Inforide Technologies LLC. 9430 Research Blvd., Suite 350, Echelon IV, Austin, TX. 78759. NO CALLS

VegaStream, Inc., located in Boca Raton is seeking F/T expd. Manager of Product Support to research, design, and developing of computer software systems, in conjunction with hardware product development. Analyze software requirements to determine feasibility of design within time and cost constraints. Consult with hardware engineers and other engineering staff to evaluate interface between hardware and software, and operational and performance requirements of overall system. Formulate and design software system, using scientific analysis and mathematical models to predict and measure outcome and consequences of design. Bachelor's degree in Computer Science, competitive salary. Fax resume to David Gellen (561) 995-6027.

COMPUTER PROGRAMMER-ANALYST Plans, develops, tests, installs, implements and documents the performance of the Electro-Tech suite of software applications for the testing of electrical engines and drives for an electrical engineering and servicing company. Applies knowledge of programming techniques and computer systems as well as experience in electrical engineering to evaluate user requests for new or modified programs or systems, and to determine feasibility, costs and time required, compatibility with current system and computer capabilities. Consult with user to identify current operating procedures and identify problems and objectives. Read electrical engine manuals, periodicals and technical reports to learn ways to develop programs and upgrade existing programs to meet customer needs. Formulate plans outlining steps required to develop program and submit plans to user for approval. Utilize knowledge of MATLAB and Simulink software applications to test engine models at different parameters in computer simulation for basic engine testing. For more complex engine testing that is beyond the capacity of MATLAB and Simulink, utilize C/C++ to create software applications for users that will test electrical motors and engines at different parameters in computer simulations and to determine effect of conditions on an engine prior to actual implementation of conditions on actual engine. Prepares flowcharts and diagrams to illustrate sequence of steps program must follow and to describe logical operations involved. Converts project specifications into computer code using knowledge of C/C++. Enters commands into computer to run and test programs. Reads computer printouts to detect syntax or logic errors during testing and uses diagnostic software to detect and correct errors. Analyzes, reviews and modifies program to increase operating efficiency or adapt to new requirements. Writes documentation to describe program development, logic, coding and corrections. Assists users to solve operating problems. Recreates steps taken by user to locate source of problem and rewrites program to correct errors. Trains users to use program. Oversees installation and testing or program and hardware. Provides technical assistance to program users. Monitor performance of program after implementation. Minimum Requirements: At least two (2) years of college in Electronics, Electrical Engineering, Computer Science or related field and two (2) years in job offered. Plus at least two (2) years of practical work experience in C/C++ as demonstrated by statements from prior employers or teachers. Must be fluent in the use of MATLAB and Simulink for testing of engine models in computer simulation as demonstrated by a proficiency test to be administered by an outside expert. $60,736/year. Location of job: Parker, Colorado. 40 hour work week. Submit two (2) copies of resume to Employment Programs, PO Box 46547, Denver, CO 80202 and refer to job order number CO5034407.

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Upcoming FCC review has big implications

■ BY MICHAEL MARTIN

Within weeks the Federal Communications Commission is expected to change regulations on which competitive telecom providers rely to offer local phone services to business customers, but it's still unclear whether the changes will favor those providers or their incumbent phone company rivals.

There's a lot at stake for both sides.

Competitive local exchange carriers (CLEC) say that if the FCC changes the rules in the incumbent local exchange carriers' (ILEC) favor, there will be less telecom competition, which could mean fewer choices and higher prices for users.

ILECs say that if the FCC doesn't rule their way in its so-called triennial review the ILECs will lose money on their network investments and be less inclined to upgrade or expand operations. This could mean that users looking for new ILEC services, such as broadband, would have to wait longer.

The FCC is examining its rules regarding unbundled network elements (UNE) — the pieces of a network that incumbent carriers such as Verizon, SBC Communications, BellSouth and Qwest must make available to local competitors such as AT&T and WorldCom and a host of smaller regional CLECs.

UNEs include elements such as local loops, switching and transport between central offices. What bothers the ILECs is they must sell UNEs to competitors at discounted prices. A typical UNE platform includes at least a local loop and switching.

"The FCC is going to take a serious look at UNE [platforms]," says J.P. Gownder, an analyst with The Yankee Group.

It's extremely unlikely the FCC would put an end to UNEs, Gownder adds, because the U.S. Supreme Court has upheld the FCC's UNE pricing model. What could happen though, is that the FCC could look at how it draws up the UNE lists region by region, rather than continue using one list for the whole country, Gownder says.

Scott Randolph, director of federal regulatory for Verizon, says the discounts on UNE platforms range from 40% to 60% — much higher than the approximately 20% discount the ILECs offer to CLECs on a resale basis for switched access lines.

Verizon and other ILECs say they would like to see at least the switching portion of UNE platforms removed from the list of platforms the ILECs must offer.

The thinking behind UNE platforms was that CLECs could use them to build market share until they acquired enough customers to install their own switches. The problem, Randolph says, is that UNE platform pricing is so low there's no incentive for the CLECs to invest in their own network equipment.

SBC Communications has issued a recommendation to the FCC seeking to immediately end UNE platform sales to business customers and to phase out sales to residential customers over one year.

The problem with that plan, says Russell Frisby, president of CLEC association CompTel, is that ILECs lack the operations support systems and personnel to switch UNE platform customers to CLEC switches.

"If you look at SBC, they say they can do 500,000 hot cuts per year, which seems great except there are 4 million UNE [platform] customers in SBC territory," he says.

CLECs say they would like the UNE platform rules to stay essentially unchanged. ■

Security

continued from page 1

month cited security software as their top spending priority in 2003.

Singlefin developed its own content-filtering and antispam engine, which it will sell as part of its service. Singlefin uses Sophos and Trend Micro antivirus software as part of its service, for which it charges $50 per month to process 100M bytes of data for antivirus and content-filtering, and 30 cents per megabyte over that. Singlefin will compete against service providers such as Brightmail and Postini.

The start-up also will take its content-filtering engine and collocate it on a customer's site as an appliance and manage it remotely for $2,500 per month — dropping the per-megabyte charges.

Some early adopters of Singlefin's service say it's an inexpensive and highly effective way to outsource antivirus and content filtering at the gateway. Irvine, Calif., advertising firm Riechesbaird has Singlefin scan for "garbage, porn, viruses and spam," says Trevor Seeman, the firm's director of IT. "Last month my company got 12,000 e-mails inbound and 9,500 of them were spam. And Singlefin's service picked up 154 viruses."

Seeman says Singlefin provides a console to view any mail that's filtered out so he and authorized employees can view this quarantined mail to make sure nothing important is sifted out.

Meanwhile, Imprivata, which received its investment money from Polaris, Highland Capital and General Catalyst, is targeting one of the more complicated areas of security management: setting up a way for users to gain access to applications via single sign-on identity management so users don't have to retain multiple passwords or other credentials.

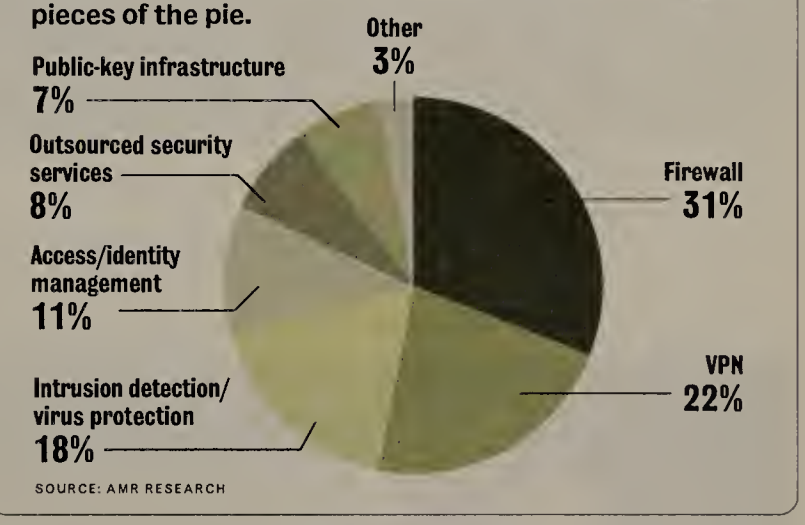
Imprivata's OneSign product consists of the single sign-on appliance, which controls access to corporate intranet applications by checking the user's identity, which is controlled by Imprivata client software.

"This client component basically replaces the Microsoft log-in and authentication," says Satish Maripuri, Imprivata's senior vice president of sales. The client can be installed to control access to desktop or network-based applications, both Web and proprietary. The single sign-on package costs $20,000 for up to 5,000 users and is expected to ship later this quarter.

"They're competing against PassLogix, Protocom Development Systems and Bell Labs in this narrowly defined area of identity management," says Pete Lindstrom, an analyst with Spire Security. OneSign marks the first time that single sign-on has debuted as an appliance, which often is seen as easier to deploy and manage than software-based security.

Prioritizing security

In 2002, IT managers split their security spending among technologies, with firewalls and VPNs getting the biggest pieces of the pie.



SOURCE: AMR RESEARCH

Good timing?

The Singlefin and Imprivata services and products could come at a good time as research firms such as AMR Research predict that security budgets will increase 5% this year (see graphic).

Ohio Savings Bank in Cleveland plans to spend 12% more this year over last on items that include identity management, VPNs and host-based intrusion detection, says Matt Speare, director of IT risk management.

Harlan Bakeries in Avon, Ind., expects to dedicate 9% of its IT budget to security-related purchases, up $30,000 in 2003 from last year, says Thomas Wagenhauser, IT manager.

"This year we are implementing a complete 802.11b wireless network for our dry and frozen warehouses to automate picking and put-away procedures," Wagenhauser says. "One of our biggest concerns with a wireless network is, and always will be, focused on security."

The set of federal regulations known as the Health Insurance Portability and Accountability Act (HIPAA) is driving investment in security among healthcare companies. "A high priority is the security necessary to meet the April HIPAA privacy regulation," says James Olson, CIO at Waterbury Hospital in Connecticut. "Our budget is up $50,000 for security."

Gartner anticipates hardware-based appliances and managed service providers are likely to gain share in security user spending at the expense of security software vendors. For Singlefin, as a service provider of e-mail antivirus and content filtering, and Imprivata, which is beta-testing its single sign-on gateway appliance, that's a good omen. ■

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BackSpin Mark Gibbs

Dream tablet

2003. Wow. I can remember being about 8 years old and working out how old I'd be in 2000. Now 2000 has shot past and here we are, with three years of the naughties behind us.

So, what would I like to see from this new year? Well, let's skip the obvious (the Dow back to 10,000 and Nasdaq beyond 2,000, Saddam out of the way and ABC's assurance that there will never be another series of "The Bachelor") and think about the IT industry.

Of course, I've got my fingers crossed for an upswing in IT expenditure and recruitment, but again, those are pretty obvious things.

I'll tell you one thing I'd really like to see appear this year — a real tablet computer. I've toyed with the latest crop of these devices, and while I like a lot of what I see, the vendors playing in this market haven't cracked the magic formula yet.

The magic formula would be a device that would be useful and practical in a way that PDAs such as the Palm and my favorite, the Sharp Zaurus, only manage to brush against.

To begin with, the magic tablet would be truly pencentric rather than the pen-interface-but-sometimes-you-really-need-a-keyboard version of Windows XP Tablet PC Edition.

Now to give Microsoft its due, the company has managed to kick-start a market that has been moribund for years: the pen computing market.

It was ripe for resurrection but how did Microsoft do it when others have made little headway? Simple, Microsoft bullied the market into existence. This was easy because Microsoft effectively sets the agenda for so many of its licensees. If you are Compaq or Sharp the appeal of building a tablet-style machine was minimal until Microsoft validated the idea by producing XP Tablet Edition.

It makes sense that Microsoft would want to get into this market. For all intents and purposes it owns the desktop operating-system market, and to maintain growth it needs to own and drive the next big thing. Wi-Fi hasn't been that thing for Microsoft and neither were a number of other technologies. But tablet-based machines have huge potential.

So is Microsoft's operating system for this market, XP Tablet Edition, better than previous pen-based operating systems? No. But it is better-promoted, and it is offered by the biggest gorilla in the game. That guarantees that vendors will jump on board.

But we have yet to see a real tablet machine.

"What," you might be asking, "would such a tablet look like?" Simple — there are only five factors to get right.

Price: Less than $1,000 for business and less than $500 for consumers.

Weight: Not much more than a hardcover book — these things have to be truly portable.

Networking: 802.11a and 802.11b and 10/100M bit/sec Ethernet built-in.

Battery life: At least eight hours, 12 preferred.

Design: Truly pencentric. Instant on, instant off and instant reboot. An unbreakable screen and expansion slots that don't interfere with your grip. A screen that is viewable in daylight. Coffee-proof and peanut-butter-proof. Capable of surviving a fall from six feet onto concrete. And finally, a practical pen user interface.

And the biggest factor of all: When you write on the device, it must feel natural. I want the kind of drag I feel on paper under my stylus, otherwise I can't write easily.

That's it, a simple list. I challenge any vendor to show me a tablet machine that meets even 80% of these criteria. Should a vendor show me anything more than 90%, then Christmas 2003 will have come early!

Take a tablet and call me at backspin@gibbs.com.

'NetBuzz News, insights, opinions and oddities

By Paul McNamara

Readers share e-mail faux pas

Before the holidays, Buzz asked readers to submit their favorite "embarrassing e-mail story."

Dozens of you stepped up with examples both amusing and painful. As might be expected, a few have been judged unfit for this family trade publication . . . especially the one that involved an Australian gent, his girlfriend, the girlfriend's "mum" and an e-mail account that both women shared. What follows is a sampling of the best of the rest:

Here's one that etiquette experts would have trouble with on a number of scores.

"As an HP OpenView consultant, I'm a subscriber to the ovforum mail reflector along with 2,000-plus other people all over the world," Rolf Frydenberg writes. "One of those other people missed out when he sent e-mail invitations to his wedding: Not only his closest friends received it, but the ovforum list as well. Some of us (for example, here in Norway), sent a reply — to the list, of course — that we thought it was a bit too far to travel, as the wedding was taking place in California. But a lot of people thanked the guy for the invitation and said they'd be there!"

A public relations professional shares this tale of candor gone awry, on the condition that the parties involved not be named.

"A client [not one of mine] asked for a rather time-consuming research project . . . in fact, it became kind of a boondoggle," he writes. "So when the junior staff member working on it forwarded the results to the team leader, she slugged the e-mail 'Your dumb-ass project.' Unfortunately, the team leader simply forwarded the e-mail to the client without changing the subject line."

A handful of submissions involved spell-checkers run amok.

"The executive vice president of a large corporation I once worked for asked me to create an e-mail explaining a new company policy," Allen Schuerholz writes. "I did so, and the VP and I traded the e-mail several times trying to get it just right. During one of these iterations I noticed that the spell-checker had suggested a change for the VP's name to something rather humorous. I let the spell-checker change it and the VP and I had a good laugh. Unfortunately, when I sent the final version of the e-mail to 10,000 employees, I forgot to change the VP's name back. So, instead of receiving an e-mail from Loni Springer, they received one from Loin Sprinkler."

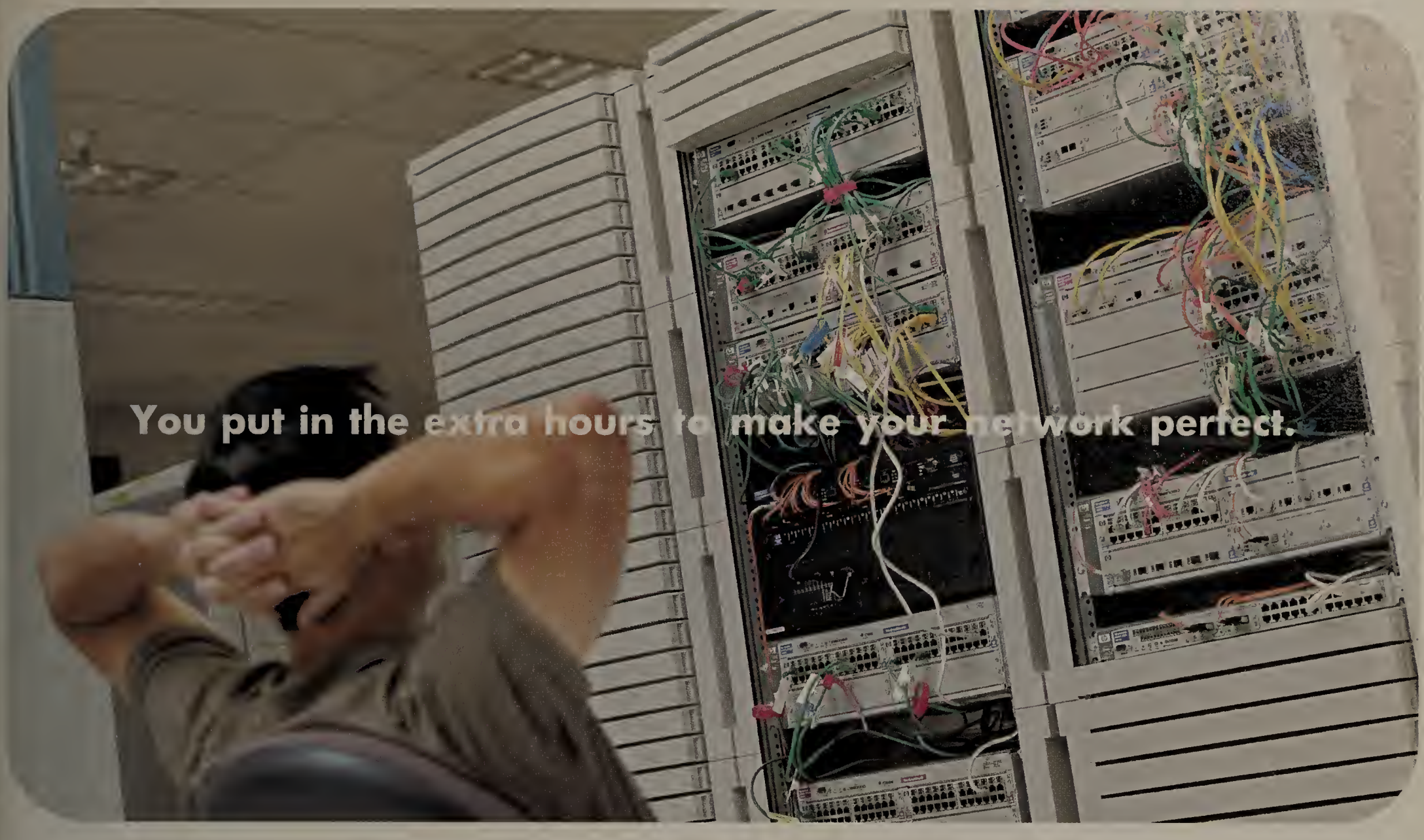
Several anecdotes involved the oh-so-easy mistake of pulling the wrong name out of your address book.

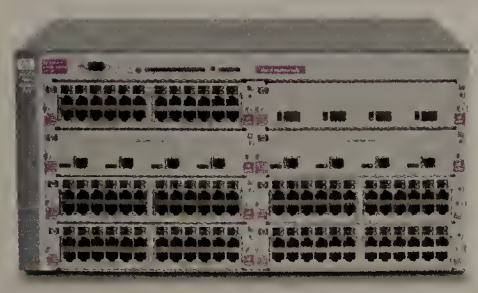
"During the recent telecom crash, I was involved in executing a major downsizing," recalls a reader who asked not to be named. "In e-mailing one of the near-final plans late one night, I accidentally selected the wrong 'Jim' in my address list — instead of sending the layoff list to my divisional vice president, I sent it to one of our most troublesome and underperforming employees. This individual would have been on the layoff list even if it were only one person long. . . . You can imagine the painful phone call I had to make, asking this usually uncooperative person to please not disclose the news until the entire plan was executed. To his credit, he did cooperate, but I think it was mostly due to the generous severance they all received."

This next one took a toll on a fellow named Marv, whose only involvement in the tale is that he manages a fuel depot.

"When a fuel station for our county's public works department had to be repaired, the administrator in charge of the systems put out an e-mail stating that it was closed and all road crews would have to fill up at one of the other depots," Stan Bradshaw writes. "When the fuel system was brought back online, she sent this message to all county employees: 'Marv has gas now.'"

Have something to say? The address is Buzz@nww.com.





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